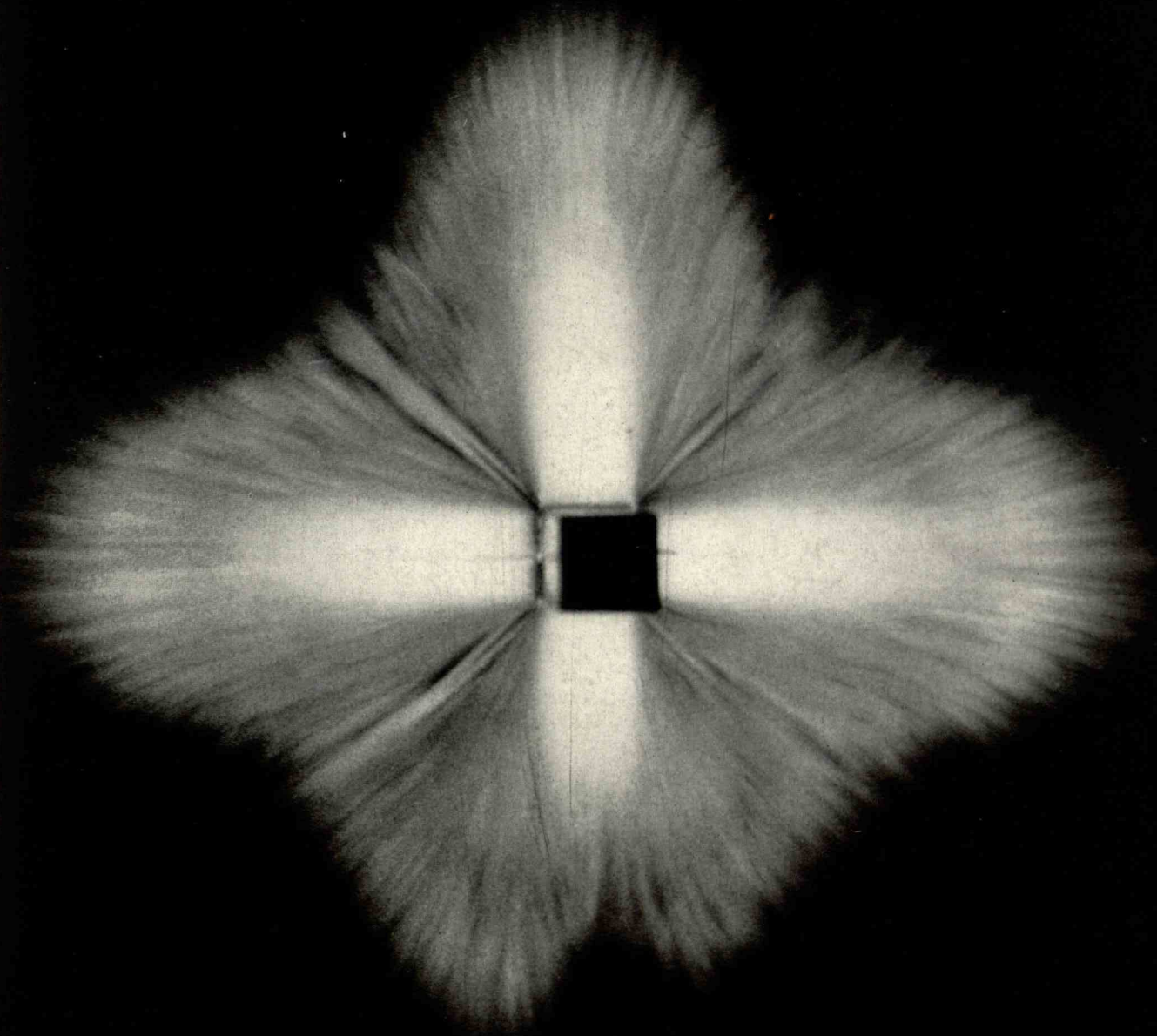


TECHNOLOGY

REVIEW

March 1952

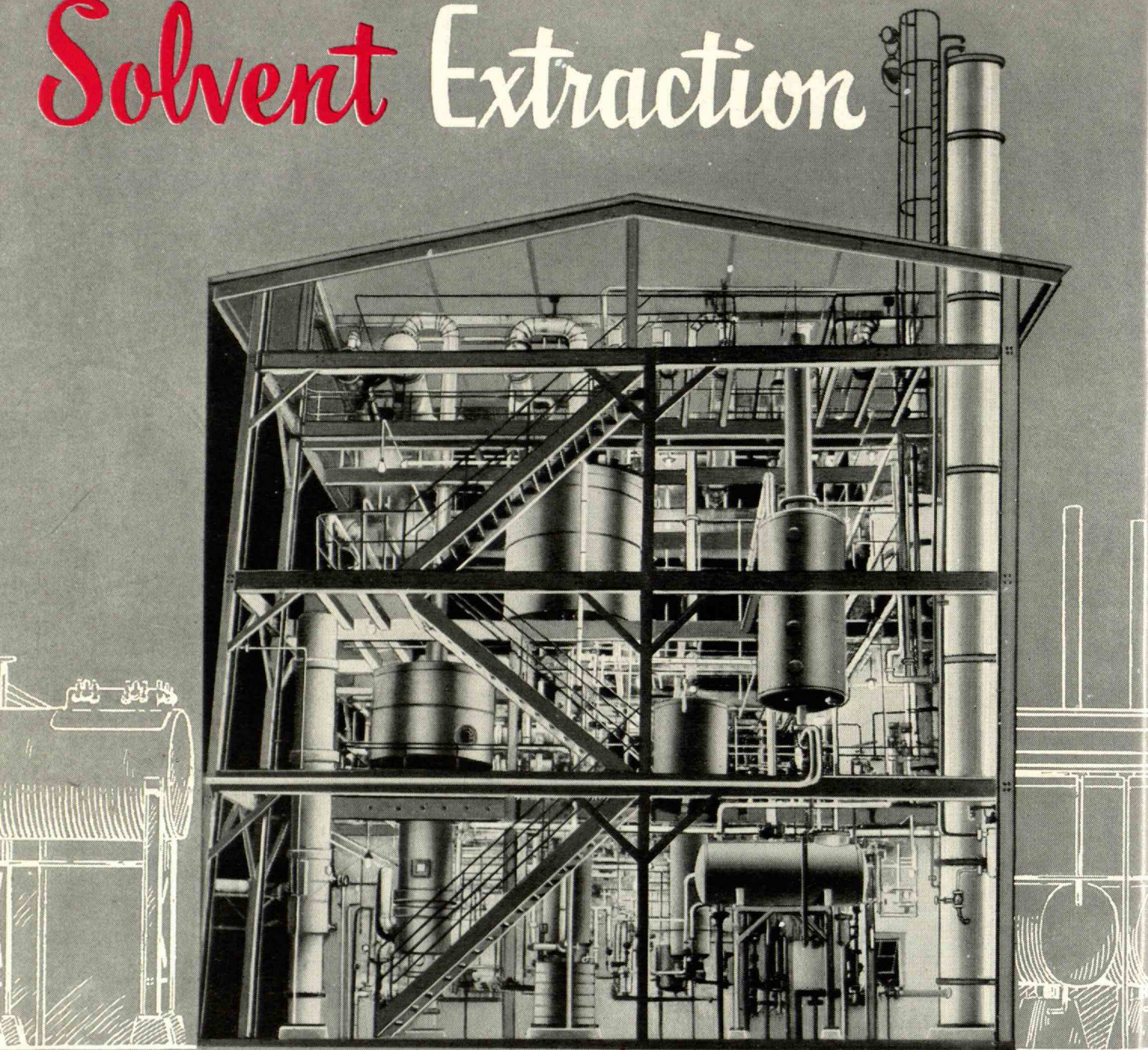


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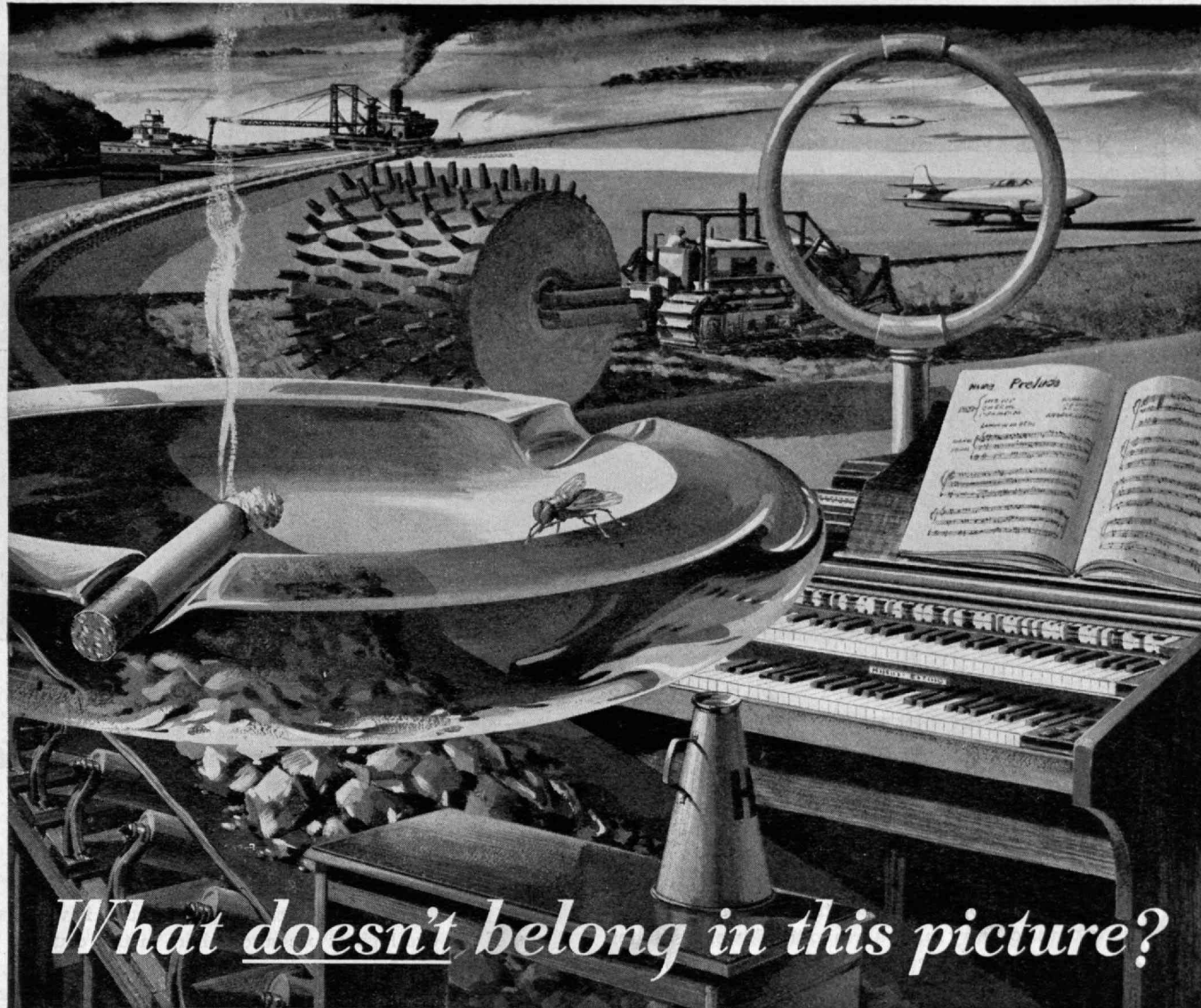
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What doesn't belong in this picture?

All but one of the objects in this picture have something in common — Norton or Behr-Manning abrasive products are vital factors in their manufacture and in their quality. *Can you find the stranger?*

The sheepfoot roller? No! Before it went to work compacting and leveling airstrips, it got its rugged strength and odd shape from processes that call for the top performance of Norton grinding wheels and refractories and Behr-Manning coated abrasives.

The organ? No! The rich finish of its woodwork comes from coated abrasive paper for which Behr-Manning is famous. Its smooth tones come from precision parts that result from the uniform grinding action of Norton and Behr-Manning products.

The ash tray? No! The entire glass industry relies on Norton and Behr-Manning abrasive products for many grinding and cutting operations.

The cigarette? No! Norton and Behr-Manning abrasives contribute in many ways to smoking enjoyment. For example, the circular blades that cut cigarettes cleanly to size are continuously sharpened by Behr-Manning abrasive discs.

The stranger in the picture is the fly. Remember, any man-made product . . . whether of metal, wood, paper, cloth, leather, ceramics or plastics . . . depends in some important way on abrasives, abrasive products, refractories or grinding machines that bear such well-known trade-marks as Norton and Behr-Manning...the world's largest manufacturers of abrasives and abrasive products.



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PREVIEWERS *of a*

ON DECEMBER 5, 1941, these utility engineers from all parts of the country made a trip to the Somerset Station of Montaup Electric Company, Somerset, Mass., to see a new boiler...a radically different boiler...a controlled circulation boiler.

The main difference between the Montaup boiler and American power boilers of conventional design was that it employed a new and different principle of circulation. Its circulation was *controlled*. With this principle, a specially designed pump is used to maintain positive circulation throughout all parts of the boiler and the flow to each section is controlled according to its needs. Conventional, or natural, circulation boilers on the other hand, depend entirely on heat to maintain circulation and do not permit positive control of flow to different circuits.

Previously, controlled circulation had been in use commercially in Europe, but only in relatively small boilers. This was the first application in an American power station and it had the further distinction of being the first boiler to produce steam at a temperature as high as 960° F. At

2000 pounds per square inch design pressure, it was also one of the two highest pressure boilers in this country.

One major advantage of controlled circulation is that it is ideally suited to use in the higher pressure range where heat as a means of circulation becomes less effective...and it is in this higher pressure range — from 2000 pounds per square inch up — that higher overall plant efficiencies can be achieved. There are, of course, collateral advantages such as:

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- **new flexibility in proportioning boilers to fit existing space;**
- **quicker starting up and shutting down;**
- **maximum number of service hours per year.**

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Combustion Engineering—Superheater, designers and builders of the boiler, the Montaup Electric Company and the consulting engineers, Stone & Webster Engineering Corporation solved these problems has been demonstrated by the boiler's highly successful performance record over a period of years. Moreover, the proven advantages of controlled circulation have so impressed leading utility companies that they have placed orders with Combustion in the past 18 months (see list at right) representing a total investment of more than 50 million dollars. Orders have also been received from the U. S. Navy for C-E Controlled Circulation Boilers to power two destroyers of an advanced design.

• • •

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Utility companies that have C-E Controlled Circulation Boilers on Order

Contracts cover a total of 18 units to serve an aggregate turbine capacity of 2,500,000 Kilowatts. Design pressures range up to 2650 pounds per square inch.

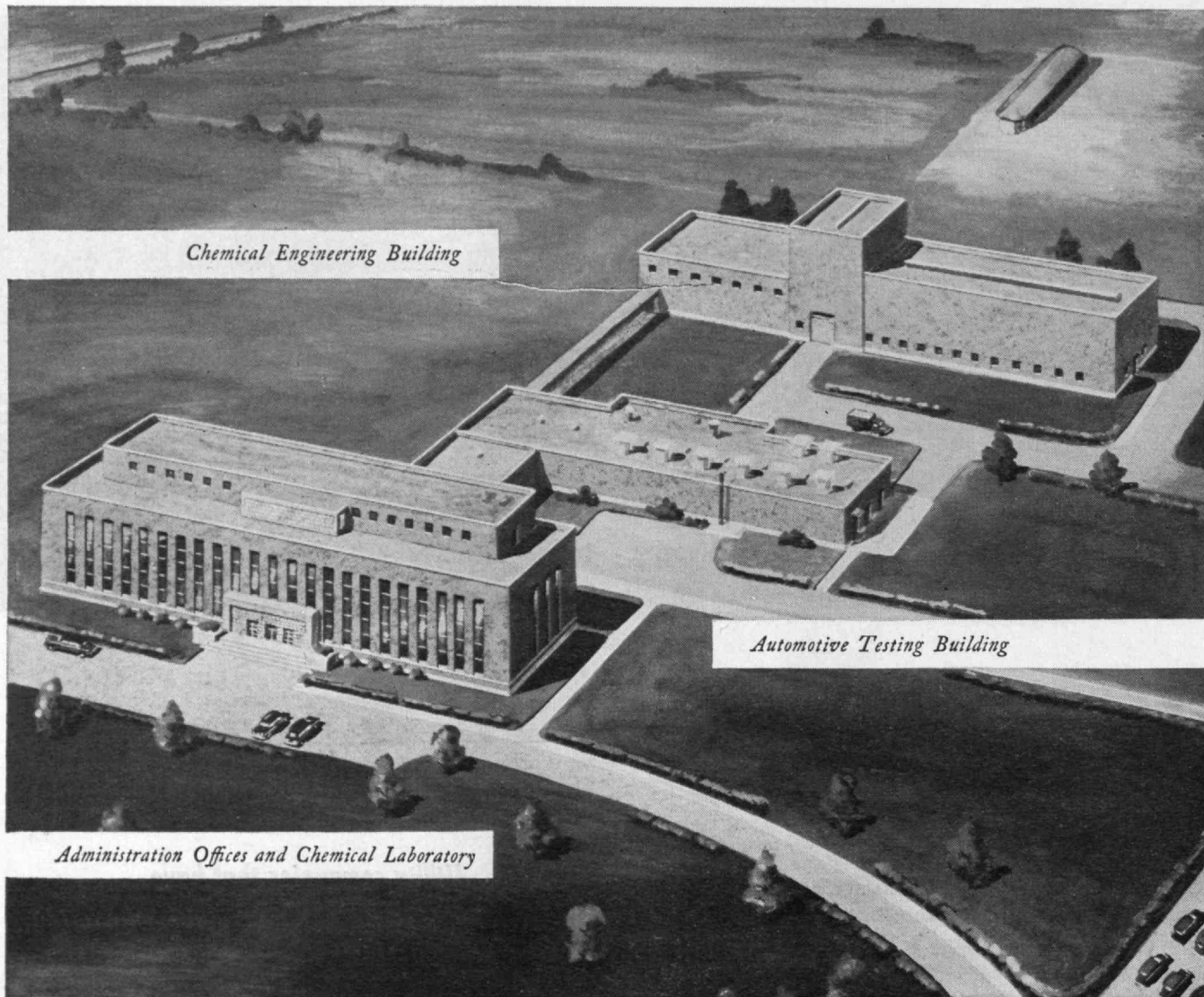
Company	Plant Location	Capacity per unit lbs. of steam per hr.
Cleveland Electric Illuminating Co.	East Lake, Ohio	875,000
Consumers Power Company	Essexville, Mich.	1,050,000
Duke Power Company	Spencer, N. C.	900,000
Philadelphia Electric Company	Chester County, Pa.	1,450,000
Public Service Electric & Gas Co.	Kearny, N. J.	1,015,000
Southern California Edison Co.	Etiwanda, Calif.	920,000
Virginia Electric & Power Co.	Wheelwright, Va.	750,000
	Gilmerton, Va.	750,000
Wisconsin Electric Power Co.	Milwaukee, Wis.	795,000

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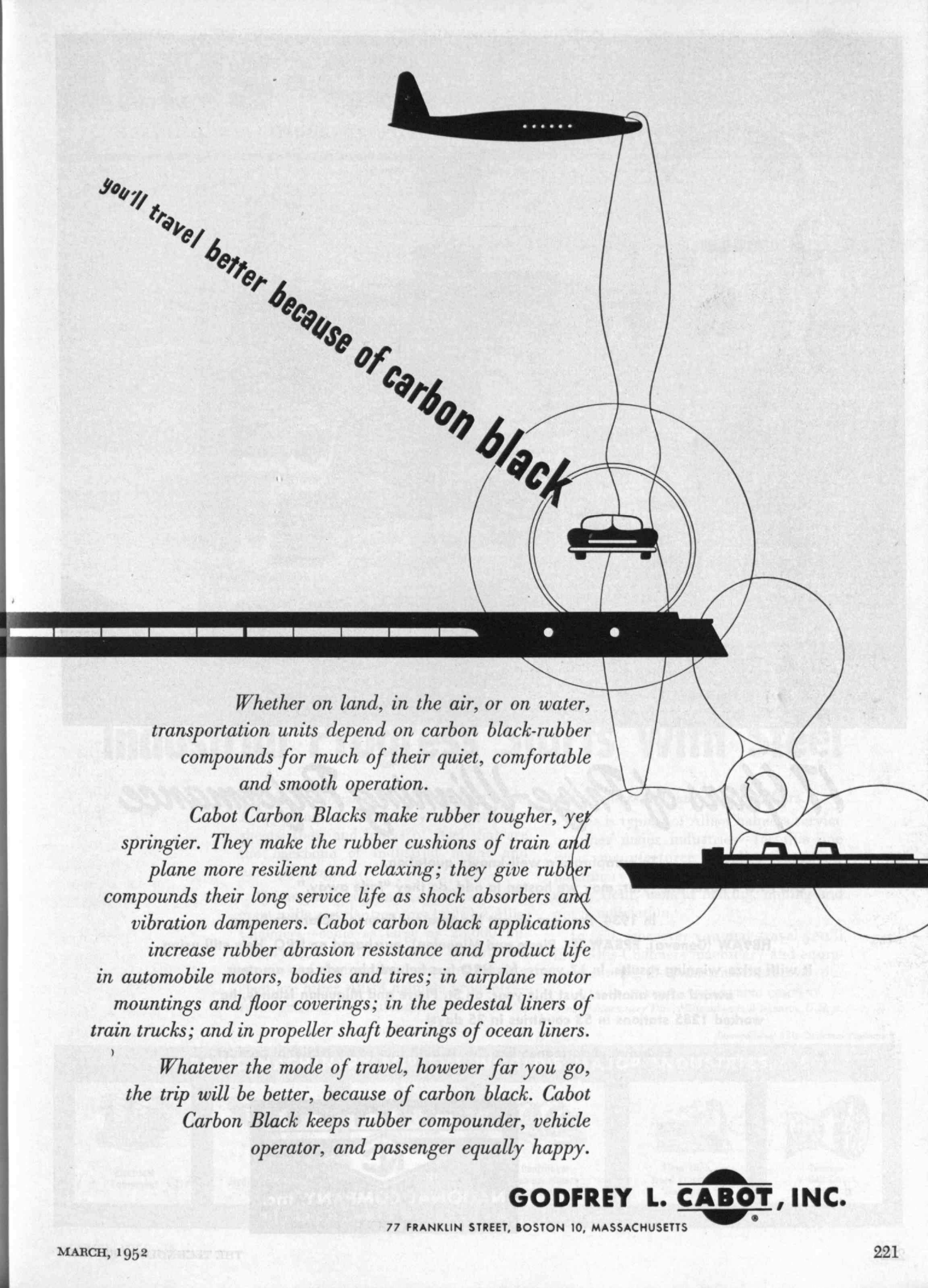
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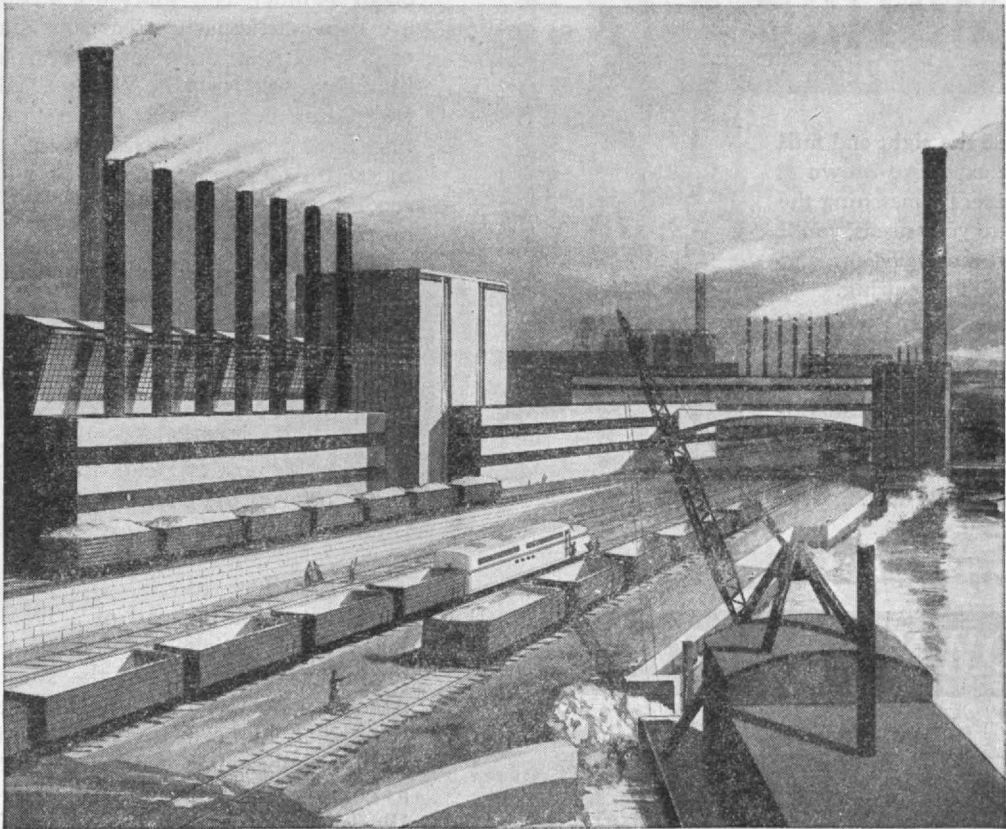
In 1934, the year he got his amateur license, Gerard de Buren, HB9AW (Geneva), FP8AW (St. Pierre and Miquelon), purchased an HRO. He's still using it with prize-winning results. In 17 years, his HRO has helped him win one amateur award after another. Just this year, on St. Pierre and Miquelon Islands, he worked 1285 stations in 53 countries in 35 days!

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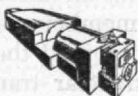
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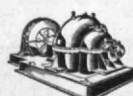
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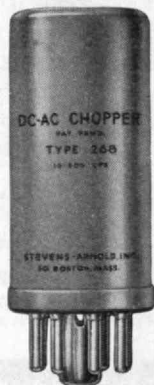
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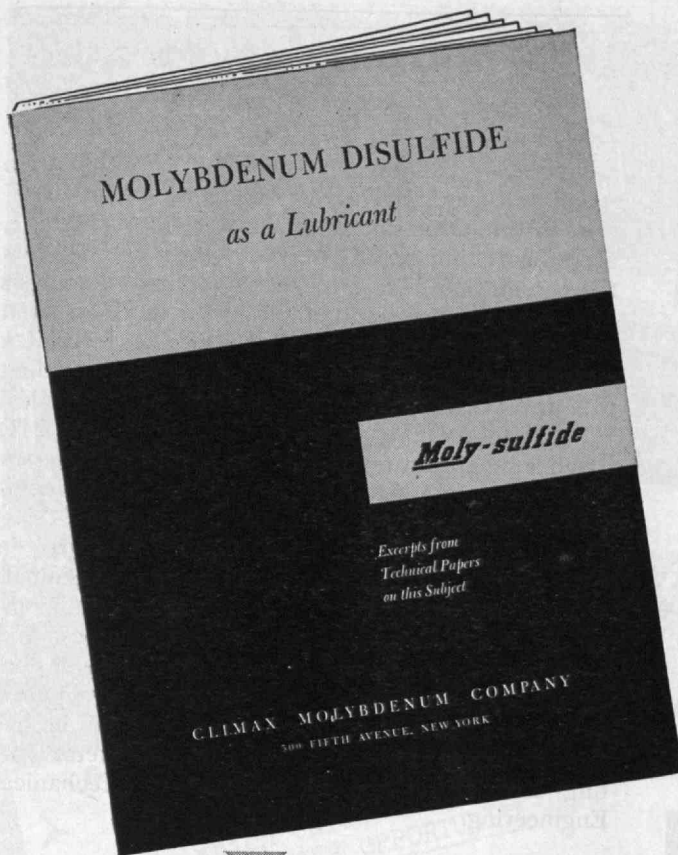
22 ELKINS STREET, SOUTH BOSTON 27, MASS.

THE TABULAR VIEW

Future. — Uncertainty accompanies any prophecy, but forecasts of events which may be expected to occur as much as a quarter of a century in the future are in a particularly precarious state. That the role of prophet is an unenviable one is clearly recognized by PROFESSOR JOHN B. WILBUR, '26, whose imaginative vision enables him to discern (page 235) what may be in store for us two or three decades hence, as the result of progress in civil engineering. Although second only to military engineering in seniority, civil engineering is not the quiescent, staid branch of applied science which many suppose it to have become because of age. As a matter of fact, as Professor Wilbur points out, fundamental research now in progress in this field brings to civil engineering a new vitality and activity which is nonetheless significant even if not too widely recognized. As consulting engineer with Fay, Spofford, and Thorndike, of Boston, in addition to his post as Head of the Department of Civil and Sanitary Engineering at M.I.T., Professor Wilbur is eminently qualified to discuss trends in civil engineering. He holds three degrees from the Institute and since 1930 has trod the traditional academic steps from instructor to head of a Department at M.I.T. Dr. Wilbur's article represents the text of an address given before members of the student branch of the American Society of Civil Engineers. The informal, somewhat humorous vein in which the article is written embraces a good deal of sagacity presented as coming from the mouths of alert Faculty members. Illustrations for this article are from the drawing board of Henry B. Kane, '24.

Past. — The steady march of daily progress occurs so gradually that it is only in retrospect that significant changes come into true focus. We have been witnessing the tearing up of streetcar tracks for many years now without being much concerned about the social and technological changes which such action makes in our way of life. The full impact of such evolution is ably discussed (page 240) by HENRY BOWEN BRAINERD, born in Wellesley in 1907, graduated from Harvard in 1929, and now a staff member of the Institute's Instrumentation Laboratory where he is working primarily on problems of applied mathematics. Mr. Brainerd's hobby is streetcar railroading and, with the love of a true amateur, he has served (from 1940-1951) as chief engineer, and is now vice-president of the New England Electric Railway Historical Society. At Kennebunkport, Maine, this active and ambitious organization is building an operating museum of trolley cars, called the Seashore Electric Railway. It is from his all-absorbing avocation — and from co-operating members of the N.E.E.R.H.S. — that Mr. Brainerd obtained the material for his historical survey of streetcar transportation, including the timetables, maps, fare data, and local coloring mentioned in the imaginary trip from Needham to West Brookfield, Mass. All aboard! Ding! Ding!

(Concluded on page 226)



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THE TABULAR VIEW

(Concluded from page 224)

Present. — Hundreds of millions of dollars are spent each year in the machine-tool industry for operations which, at best, have an empirical basis and are, accordingly, imperfectly understood. In recent years the potent tools of scientific observation and analysis have been applied to a number of the more essential and fundamental operations in this field. As a result, a renaissance in metal cutting is taking place, according to MILTON C. SHAW, Associate Professor of Mechanical Engineering, whose article in this issue (page 245) outlines significant research at the Institute. Professor Shaw's undergraduate training in mechanical engineering was received at Drexel Institute of Technology, from which he received the B.S. degree in 1938. During the next four years he was Cincinnati Milling Machine fellow at the University of Cincinnati where basic work in chemistry, physics, and mathematics was taken, leading to the degree of doctor of science in 1942. In 1946 Professor Shaw joined the teaching staff of the Institute. Since 1950 he has been in charge of the Machine Tool and Metal Cutting Division of the Department of Mechanical Engineering.

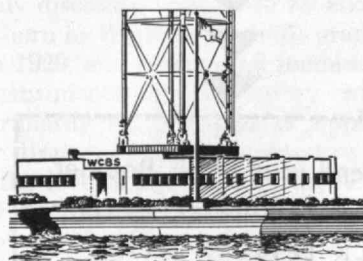
MAIL RETURNS

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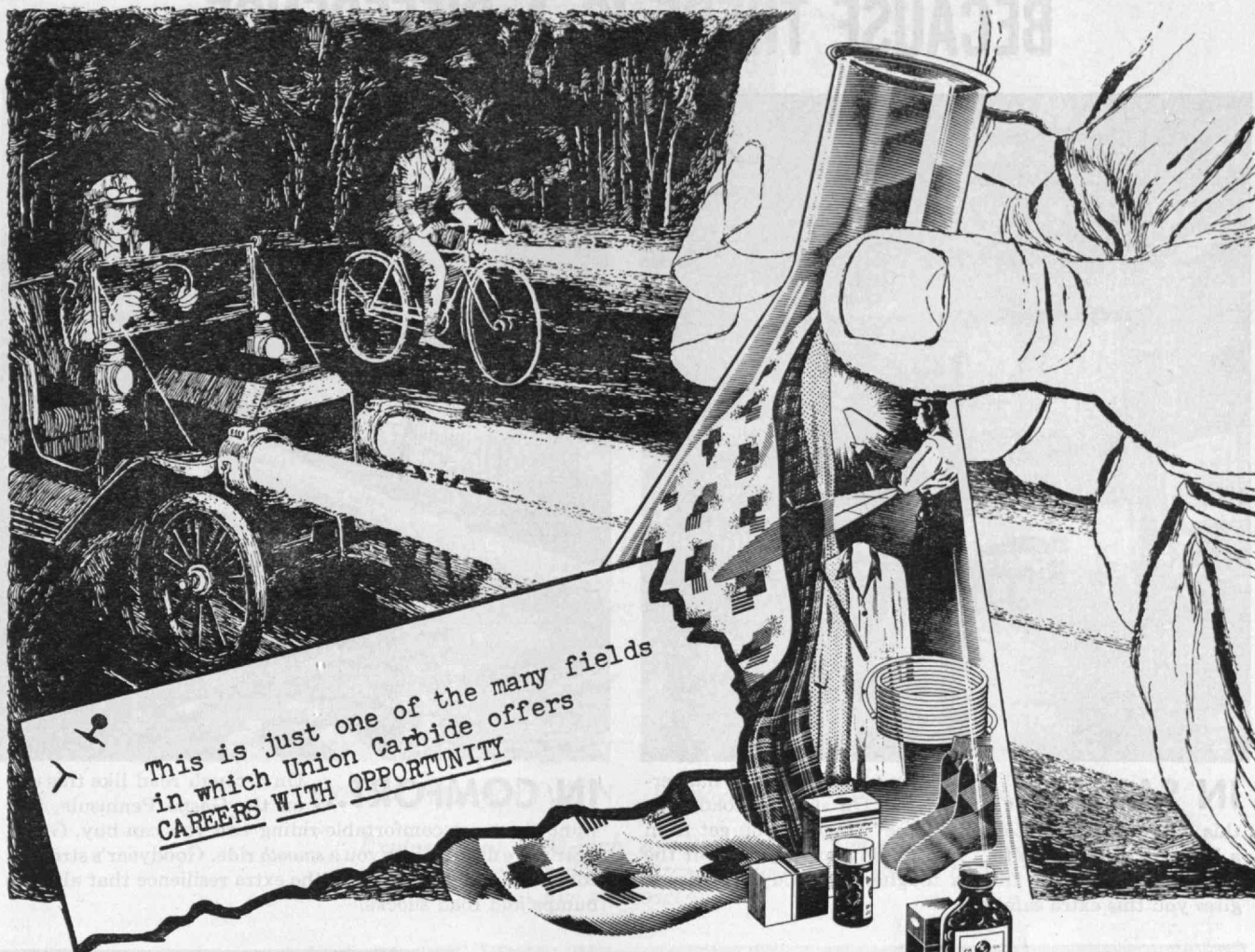
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FORTY YEARS AGO acetylene gas made from calcium carbide was used for home and street lighting, and was in common use for bicycle and automobile lights. Though these old lights have long since gone out, acetylene has gone on to chemical greatness.

IN CHEMICALS—Today, acetylene is the parent of hundreds of chemicals and chemical products used to make plastics, insect sprays, vitamins, aspirin, sulfa drugs and many other things.

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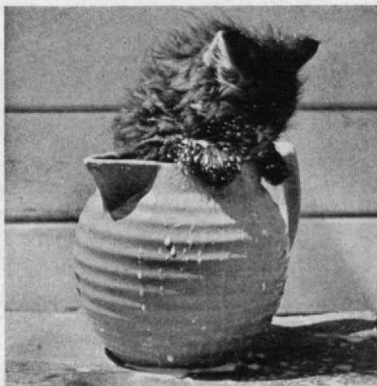
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THE TECHNOLOGY REVIEW

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Vol. 54, No. 5

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Explosion of a 3/4-inch square stick of pentolite photographed by means of the Faraday shutter developed by Harold E. Edgerton. Exposure time was five microseconds

END OF THE LINE • Photograph by Ward Allan Howe .. FRONTISPICE 230

WHITHER CIVIL ENGINEERING? By JOHN B. WILBUR 235

Stark realism and fancy are combined to present a picture of the way in which civil engineering will have remade our living 25 years hence

STEPBROTHER TO THE IRON HORSE By HENRY B. BRAINERD 240

Having played a noteworthy part in surface transportation, the street-car trolley joins the American buffalo as a symbol of a bygone era

RENAISSANCE IN METAL CUTTING By MILTON C. SHAW 245

When the analytical techniques of science replace the skilled empiricism of the craftsman in a field as basic as metal cutting, something is bound to happen

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Ward Allan Howe

End of the Line

THE TECHNOLOGY REVIEW

Vol. 54, No. 5

March, 1952



The Trend of Affairs

Packaged Protection

In present-day food markets, nearly all foods sold in the United States are retailed in packages which are usually convenient in size, attractive, functionally protective, and easy to open. For many years dried or partially dried foods have been sold in packages, but now it is rapidly becoming common practice to retail, in prepackaged form, fresh fruits and vegetables, fresh and cured meats, fish, and other sea-food products. In comparatively recent years food packages have become indispensable to our way of life. The trend toward the establishment of large supermarkets and progress in the field of frozen foods have both contributed in large degree to the expansion of the prepackaging industry, for protective and attractive packaging has proved a stimulus to sales.

Technological progress in food preservation in the relatively new field of food technology has also been a stimulus to the packaging industry. The development of many new types of foods, particularly of dried and of frozen foods, has been responsible for considerable research and progress in packaging. World War II was responsible for great advances in protective packaging for food rations, such as the K ration. These ration packages were required to withstand all kinds of temperature and humidity, in addition to rough handling. The packaging technologist has worked hand in hand with the food technologist in all these advances.

In the Department of Food Technology at the Institute, research has been under way since 1946 in the field of food packaging technology. This program has been conducted by Arthur H. Landrock, '49, a technical assistant in the M.I.T. Department of Food Technology, under the supervision of Professor Bernard E. Proctor, '23, Director of the Samuel Cate Prescott Laboratories of Food Technology. The major aim of the program has been the development of new and improved test methods for studying the characteristics

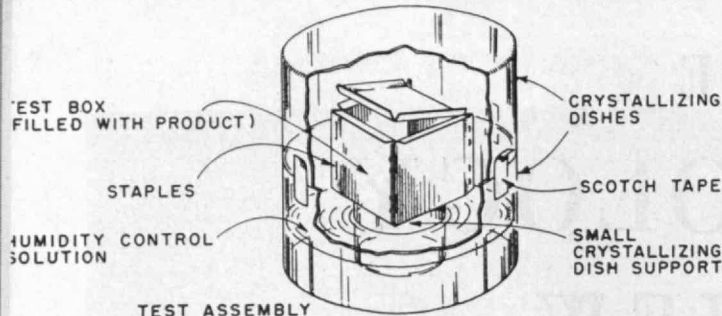
of both food products and packaging materials, methods which, it is hoped, may ultimately be accepted as official procedures for industry.

A method recently developed by the Department as a result of this program permits the rapid determination of the equilibrium relative humidity of foods and food products; that is, the relative humidity at which the substance neither gains nor loses moisture under given temperature conditions. This method, called a "graphical interpolation method," is less complicated than other methods which have been used to yield the same data.

According to the graphical interpolation method, uniform amounts of a given food product of a given moisture content are exposed to controlled atmospheres of different relative humidities for the same period of time (usually one hour) at a constant temperature. The gains or losses in weight by the samples are determined, and these values are plotted against relative humidity, with the gains appearing above and the losses below a "zero base line." A smooth curve is drawn through the plotted data, and the equilibrium relative humidity is interpolated at the point where the curve intersects the base line. These steps are repeated for the same product at several other initial moisture contents.

This method for measuring humidity equilibria has been found applicable to any type of food product, whether powder, solid, liquid, or heavy syrup. It has the advantage of enabling considerable savings in time because of the simplicity of technique.

The attractiveness of a package depends in part upon the grease resistance of the packaging material. The degree of grease resistance required is governed by the free oil or fat in the food product to be packaged. If the packaging material is not sufficiently grease-resistant, the free oil may cause undesirable stains. On the other hand, if the packaging material offers more protection than is necessary, the cost of the package will, obviously, be unnecessarily high.



The diagram above shows the construction of paper boxes used in determining the oil-staining properties of foods.

Up to the present, methods used for comparing products on the basis of their free oil content have been extremely crude. To provide the food industry with a suitable method for measuring the ability of a food product to release oil or fat to stain a package, a quantitative method of measuring free oil has also been developed. Given weights of foods are stored under controlled conditions of temperature and humidity in standard, stapled, test boxes made from high-grade photographic blotting paper. After 48 hours, the amount of oil transferred from the food to the box is determined by petroleum ether extraction, and is expressed in terms of milligrams of fat ex-

tracted per gram of food. Recommended standard conditions are a temperature of 100 degrees F., relative humidities of 30 per cent and 90 per cent, all samples being of the same weight and filling the box shown at the left. Ether extraction periods of only three hours were found to be sufficient.

Eighteen representative food products have been studied under these conditions. The amount of free oil absorbed by the test box was found to be about twice as much at a relative humidity of 90 per cent as at 30 per cent. Tests made with piecrust mixes of different fat contents indicated a logarithmic relationship between free fat and total fat content.

The combination of available quantitative data on the free oil content of foods and the degrees of grease-resistance of packaging materials should enable manufacturers to package their oily products more satisfactorily.

Present research activities of the Department in the field of packaging include a new method of measuring simultaneously oxygen and carbon dioxide permeabilities of packaging materials, a method for measuring flavor and odor permeabilities of packaging materials, and a study of the effect of multiple components on the equilibrium relative humidity of mixtures of crystalline materials.

Plastic Boats

AMONG the new materials to enter the field of small-boat construction, none appears more promising than the glass-reinforced polyester laminates. These tough, strong plastics have tensile strengths in the order of 30,000 pounds per square inch and higher, and a resistance to impact that bears comparison with that of many structural metals. An illustrative application is that of a tie plate for railroad use, made of glass-reinforced polyester resin, and now undergoing service tests on the Erie Railroad. This plate, about one-foot square, is placed between rail and wood tie, and absorbs and distributes the loads of trains passing over the rail. The plastic plate is proof against corrosion, which is the greatest enemy of the standard steel plates, and has about one-quarter the weight of the steel. Since American railroads purchase about 40,000,000 tie plates per year, this is no small matter. Numerous other structural applications of these laminates, particularly in airplanes, also exist.

This same type of reinforced plastic is competing vigorously in boat construction with steel, aluminum, plywood, and laminated wood. The last two materials, of course, are also tributes to the plastics, since their utility in marine environments is due to water- and weather-proof bonding agents of synthetic resins. Unlike iron and aluminum, which have long been used in ship construction on large hulls, and which only lately have begun to appear frequently in smaller craft, the glass-resin laminates were first tried in the very smallest craft, such as rowboats and dinghies. Here mold costs were lowest, and less was at stake if the design proved faulty. Up to the present time, it is safe to say that the bulk of the production has been

in boats under 15 feet in length. The toughness and durability shown by these craft, the reduced problems of upkeep, the relative ease of repair, and the inherent possibilities of their production processes for large-volume production, have created a marked trend toward the development of much larger plastic hulls. The Coast Guard has reported that repairs to plastic hulls possess at least 70 per cent of the strength of the original hull.

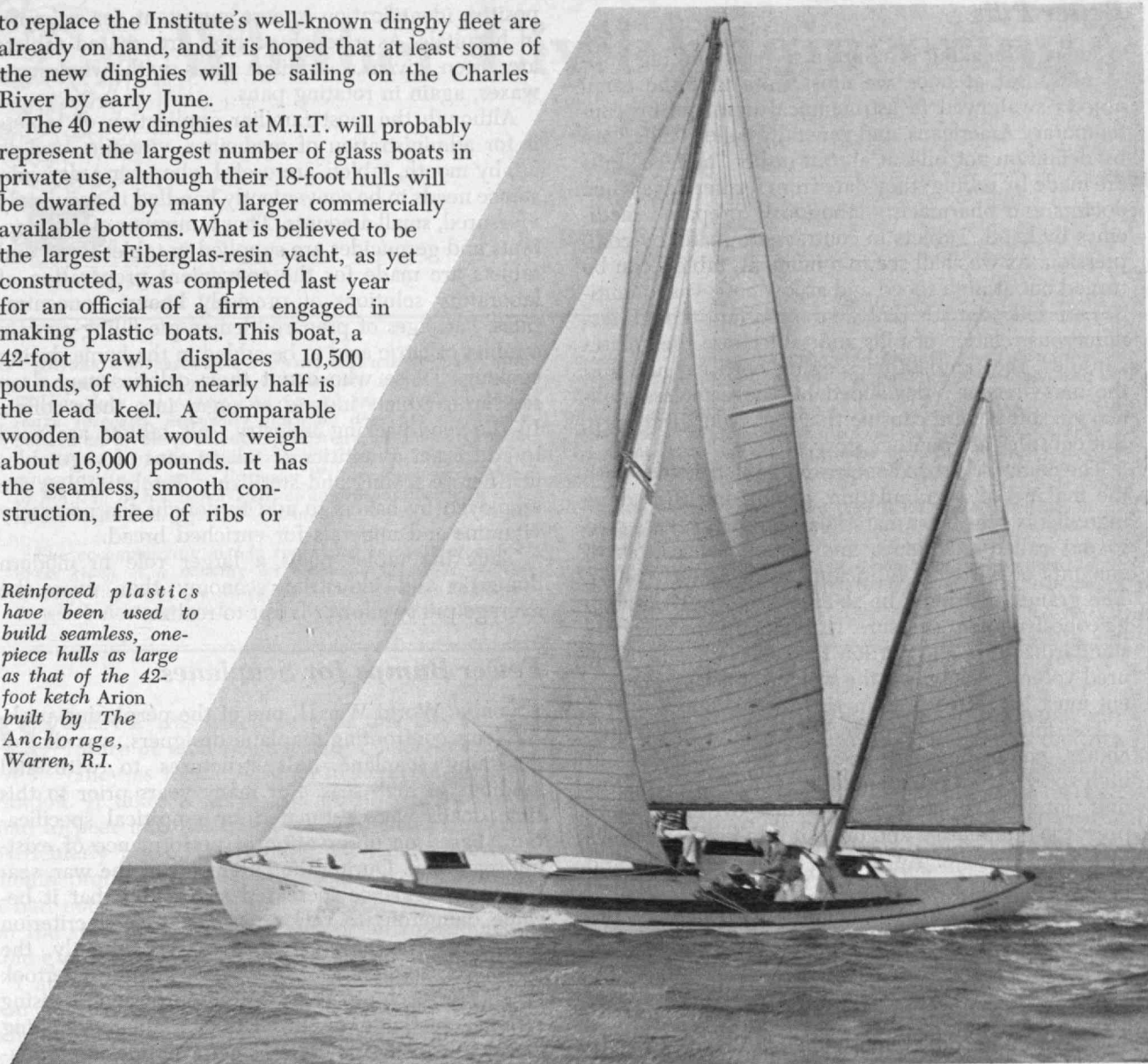
Although most of the larger designs are being built generally in prototype form for the military, small-boat owners can now buy standard plastic hulls up to about 24 feet long. In this connection it is interesting to learn that the fleet of dinghies, in constant use at M.I.T. since 1936 (and which now show signs of such wear as to make repair and maintenance a major problem) will be replaced this year. The new fleet will be similar to the original, except that Fiberglas will replace wood, and only such modifications will be made in the hull as are required to use the newer plastic process. The older boats, designed by Professor Emeritus George Owen, '94, of the Institute's Department of Naval Architecture and Marine Engineering, have given universal satisfaction, according to Walter C. Wood, '17, Sailing Master at M.I.T. Sample glass boats which have been tested on the Charles River, have been found entirely seaworthy and show every promise of meeting the rigorous demands of a collegiate dinghy fleet.

The glass-plastic hulls for the new dinghies can be obtained for the same cost or less than that necessary to build the fleet with wood, and there are good indications that repairs and maintenance will be less with the glass-plastic boats than with their wooden counterparts. A substantial portion of the funds required

to replace the Institute's well-known dinghy fleet are already on hand, and it is hoped that at least some of the new dinghies will be sailing on the Charles River by early June.

The 40 new dinghies at M.I.T. will probably represent the largest number of glass boats in private use, although their 18-foot hulls will be dwarfed by many larger commercially available bottoms. What is believed to be the largest Fiberglass-resin yacht, as yet constructed, was completed last year for an official of a firm engaged in making plastic boats. This boat, a 42-foot yawl, displaces 10,500 pounds, of which nearly half is the lead keel. A comparable wooden boat would weigh about 16,000 pounds. It has the seamless, smooth construction, free of ribs or

Reinforced plastics have been used to build seamless, one-piece hulls as large as that of the 42-foot ketch Arion built by The Anchorage, Warren, R.I.



stiffeners, characteristic of molded boats, and a hull thickness that varies, as required, from about one-fourth inch to about one inch thick.

Since the Navy, Coast Guard, and Army have need of many types of small boats, some of which have to be produced in large numbers on short order, they have been particularly interested in this development. To insure that the plastic hulls will be able to stand up under the very severe service that such craft must frequently endure, the services on a number of occasions have built hulls to substantially the same lines in plastic, plywood, laminated wood and metal, and are in the process of long-time tests under actual conditions of operation to determine relative merits. Among the various types, so far produced, are: a 12-foot wherry, a 21-foot rescue boat for shallow water (propelled by a water jet); a number of lifeboats, about 26 feet long; a 36-foot L.C.V.P. (landing craft) which has already been produced in five slightly differing versions and which may undergo large-scale production; and a 40-foot general utility boat which the

Coast Guard has also built in plywood, laminated wood, and steel.

A contract has been placed for the construction of two prototype mine sweepers in glass-resin laminate. These boats are intended for shallow water and harbor work, and will be 57 feet long with a 15-foot beam. Of lightweight laminates, these vessels will displace 30 tons.

While plastic laminates can be made with a wide variety of plastics and reinforcing materials, there is a growing tendency to consider this phase of the plastics industry in terms of the polyester resins with fibrous glass reinforcement. The production of polyester resins was reported to be between 8,000,000 and 9,000,000 pounds in 1950, and with it was used some 4,000,000 to 5,000,000 pounds of fibrous glass. In 1951, polyester resin production rose to over 13,000,000 pounds, and glass fiber consumption, in this field, to more than 7,000,000 pounds. Expansion in both resin and glass fiber productive capacity is continuing at a steady pace.

Better Pills

TODAY pillmaking is an art, a science, and big business. But at once we must state that the small objects swallowed in astronomical numbers by contemporary Americans, and generally called "pills," are by definition not pills at all but rather "tablets." Pills are made by rolling; they date from former days when doctors and pharmacists laboriously prepared medicines by hand. Tablets in contrast are made by compression. As we shall see in a moment, tablets can be turned out at high speed and at low cost; vast quantities are indeed made daily. An important though less numerous relative of pills and tablets are the gelatin capsules; the familiar telescoping hard capsule and the more recently developed but nevertheless well-known, soft gelatin capsule that looks like a tiny egg. But capsules are another story.

The manufacture of compressed tablets begins with the making of a granulation, comprising the active ingredients plus inert materials (starches, sugars, and so on) called excipients, and sometimes also small amounts of harmless lubricants, such as fatty acids. The granulation must be skillfully designed so as to be cohesive under pressure. Its bulk must be carefully standardized, as the portion for each tablet is measured volumetrically, yet the weight of active ingredient must be correct within narrow tolerances.

The finished granulation is fed to tableting machines, completely automatic devices operating at high speed. Here the granulation is filled into hollow dies, into which plungers are then driven to compress the granulation and unite it into finished tablets in a single stroke. By merely varying the die and plunger, tablets may be made in almost any desired size and shape. Either surface or both may be imprinted with lettering, or a trade-mark, engraved in reverse on die or plunger.

The manufacturing technique described is aimed toward accomplishment of two diametrically opposite objectives. The **tablet must**, on one hand, be sufficiently cohesive and sturdy to be unharmed by packing, shipping, and handling by the consumer. Yet, on the other hand, it must disintegrate and release its active ingredient almost instantaneously when swallowed, dropped into water, or however used. Skill in designing the granulation and in adjusting the tableting pressures achieve these aims. Accurate regulation of the bulk of the granulation, of the ratio of active to diluting ingredients, and of the volume of granulation compressed into each tablet effects exact control of the concentration of active ingredient per tablet. Thus doses can readily be made with accuracy as small as a few milligrams per tablet.

Compressed tablets are often distributed exactly as they emerge from the tableting machine. The familiar aspirin tablet is of this sort. Or art may join science for beautification by coating, coloring, or polishing.

Coating is done with sugars, in rotating pans such as are used to coat chewing gum and other confections. During the coating any one of a rainbow of harmless food colors may be incorporated. Tinting has a minor purpose in making the tablet pretty, but serves an important function of identification even if tablets become separated from label containers. Such

positive identification is most important, for example, in hospitals. As a touch of high art, coated tablets are often given a brilliant gloss with wholesome waxes, again in rotating pans.

Although the most familiar application of tablets is for administration of medicines, vitamins, and so on, by mouth, tablets are useful wherever a dry substance needs to be conveniently handled in accurately measured, small amounts. Thus a number of disinfectants and germicides are supplied in tablet form, and tablets are made for the convenient preparation of laboratory solutions of precisely known concentrations. Packages of prepared lemon-pie filling contain a tablet of citric acid to be added in the home during cooking. Those who count their calories may drop saccharin tablets instead of sugar into their coffee. In the food-packing industry, salt tablets are used to add exact quantities of salt to cans of vegetables just before sealing and sterilizing. Jumbo tablets are employed by bakers to add to doughs the necessary vitamins and minerals for enriched bread.

Thus the tablet plays a larger role in modern domestic and industrial economy than even the average pill swallower is apt to realize.

Fewer Bumps for Seaplanes

DURING World War II, one of the perplexing problems confronting seaplane designers, was that of designing seaplane hull structures to withstand landings in high seas. For many years prior to this time, loads were estimated by empirical specifications based on observation of performance of existing seaplanes. During the latter part of the war, seaplane performance increased so rapidly that it became dangerous to rely on a design load criterion based only on past experience. Consequently, the Bureau of Aeronautics, Navy Department, undertook several research programs for the purpose of devising rational methods of predicting seaplane landing loads. One of these programs emphasizing the fundamental aspects of the phenomena of impact was carried out in the Department of Aeronautical Engineering by Raymond L. Bisplinghoff, Associate Professor of Aeronautical Engineering and Carl S. Doherty, '48, of the Division of Industrial Cooperation staff.

This program combined theoretical and experimental studies of the impact of two dimensional wedges with special emphasis on the shape of the free water surface as the wedge penetrates the water. Experimental studies of the shape of the free water surface were made by high-speed photographs of the piled-up water adjacent to the entering wedge during crop tests. The studies concluded that certain easily applied impact theories can predict the shape of the piled-up water and the force-time history during impact with satisfactory degree of accuracy. In addition, methods were indicated of relating the shape of the force-time curve during impact to the cross sectional shape of the wedge. Such methods may be of value to seaplane designers in lessening impact loads. It is believed that these fundamental studies of the phenomena of impact of wedges on a water surface have produced a better understanding of loads on seaplane hulls during rough landings.



Whither Civil Engineering?

By JOHN B. WILBUR

Anyone who gazes into a crystal ball will probably find the trouble which prophecy invariably invites. Professor Wilbur does not expect everyone to agree with his long-range forecasts, especially since he does not necessarily believe all of the predictions which are, presumably, made by members of the Department of Civil and Sanitary Engineering. Incidentally, Professor Wilbur absolves members of the staff of his Department of any responsibility in connection with their "quoted" remarks.

The accompanying article represents the text of an address given at a meeting on December 11, 1951, of the student chapter of the American Society of Civil Engineers to which first-year students in Civil Engineering were in-

vited. To be sure, the prophetic manner of presentation serves to stir the imagination of budding civil engineers, but it does more than that. It demonstrates rather forcefully that civil engineering—now in the transition between empiricism and rationalism—is a dynamic branch of engineering heavily dependent on basic science and a wide range of research programs already in progress.

Possibly Professor Wilbur had his tongue in cheek in making some of the prophecies in this article. Nevertheless, those with a flair for looking beyond their noses can derive stimulation from a bit of fancy which—when the period of forecast has expired—may well prove to have fallen far short of its mark.—Ed.

WHEN I was asked to give this talk on the future of civil engineering, I had some hesitancy as to the wisdom of accepting the invitation. It takes a brave and possibly a foolhardy man to peer into the unknown, and since I am not particularly brave, and I hope not too foolhardy, I should probably have felt it necessary to decline if it had not been for one thing, namely, the presence on the staff of our Department of an exceptionally able group of researchers.

I am afraid that during the past month some of you have at times found it difficult to get into my office to discuss such weighty matters as whether or not I would permit you to drop fluid mechanics and substitute an easier subject. When Mrs. [William F.] Powers, my Secretary, told you that I was "in conference" you may have thought that I was probably either doing some consulting work or taking a nap. But such was far from the case.

The fact is that I had called together a group of our professors and put the matter squarely up to them. We needed a crystal ball, and we needed it by the morning of December 11, at the latest. We organized a research team, and appointed Henry M. Paynter, Jr., 10-44, Assistant Professor of Hydraulic Engineering, as project leader. We were in conference for as much as 18 hours a day for over a week, each of us bringing to bear all that his special knowledge could contribute to the problem. Professor Paynter had been given the grave responsibility of project leader because it was believed that in his electronic analyzer for nonlinear systems¹ he had already developed a device that more nearly approached being a crystal ball than anything else in the Department. Arthur T. Ippen, Professor of Hydraulics, was a member of the team because we

thought that the hydraulic analogy to the supersonic flow of air² might have something to do with the problem; Murray P. Horwood, '16, Professor of Sanitary Science, because it appeared hopeful that ultrasonic vibrations might have some effect on the future as well as on bacteria.³ Rolf Eliassen, '32, Professor of Sanitary Engineering, was a key member because it was unthinkable that any serious work could proceed on an ultramodern project without mixing in a few radioactive isotopes,⁴ while Robert J. Hansen, '48, Associate Professor of Structural Engineering, who had just returned from Operation Greenhouse in the Marshall Islands,⁵ played a vital role in connection with those phases of the problem involving the blast of A-bombs. I must not neglect to mention the contribution of Thomas W. Lambe, 2-44, Assistant Professor of Soil Mechanics, whose last-minute solidification by chemical methods,⁶ of the quivering object assembled by our team, converted it into a stable and usable mechanism, nor indeed the genius of Herman J. Shea, '33, Associate Professor of Surveying, whose immense knowledge of optics was instrumental in leading us to the conclusion that at least a portion of the surface of the ball should be constructed of a transparent material; and I cannot overstress the importance of this, since otherwise we could not have seen into the ball after it was completed.

²Research project on "Hydraulic Analogy to Supersonic Flow of Air" for Air Force.

³Research project on "The Biology and Biochemistry of the Zoogaea Producing Organisms Involved in the Activated Sludge Process" for National Institute of Health.

⁴Research project on "The Efficiency of Present Water Treatment Methods in Removing Radioactive Substances from Water" for Atomic Energy Commission.

⁵Research project on "Pacific Tests" for Corps of Engineers.

⁶Research project on "Solidification of Soils in the Field of Chemical Agents" for Corps of Engineers.

¹Research project on "Transient Stability of a Nonlinear System" for Research Corporation.

I hope I have given proper credit to all those who contributed to this miraculous venture, for there is certainly enough credit to go around. In any event, under the dynamic leadership of Professor Paynter, the crystal ball was not only built, but it was completed 12 hours ahead of a seemingly impossible construction schedule, and even more important, it actually worked. I shall never forget Professor Paynter's telephone call of last evening, asking me to come back to the Institute to see the completed brain child of this astounding group. Once again it had been demonstrated that in research, as in other endeavors, the teamwork of first-class minds can accomplish the practically impossible.

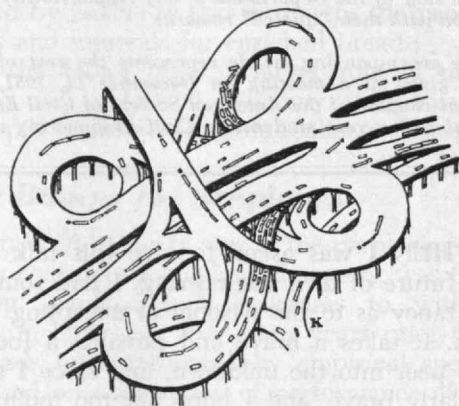


Naturally our first concern was to determine whether or not the pictures of the future as seen in the Paynterscope (for by this time we had named the crystal ball after the man whose genius had, more than that of any one else, been responsible for its development) were authentic and reliable. This was a difficult thing to determine, since there appeared to be no foreseeable events in the future against which we could calibrate the device for accuracy. In this dilemma, Professor Shea once again saved the day. At his suggestion the time scale was set at 50 years ago last summer, and the space scales set on the latitude, longitude, and elevation of our summer surveying school, Camp Technology. Fortunately, the Paynterscope caught the camp on a clear day, and the boys were all out on stadia work. The picture was so clear that Professor Shea could read the instrument numbers on the transits. Since most of these instruments were still in use at camp, he was able to identify them, and this proved, to his satisfaction at least, that our device registered accurately on the negative time scale. On this basis he argued that, by extrapolation, we were justified in trusting the positive time scale, particularly since as long as we used the Paynterscope to foretell the distant future (which after all was of greatest interest) we wouldn't be around to be blamed if it eventually proved that our forecasts were incorrect. The logic of this argument was indisputable, and accordingly at quarter of eleven last night, a moment that will surely be recorded in scientific history, the time scale was set at 25 years into the future. With Professor Paynter at the controls, Mrs. Powers taking notes, and the rest of us gazing in wonder at the screen of the Paynterscope, we were away on our exciting journey into the future!

If I look haggard this evening, it is because we kept glued to the Paynterscope until the bells rang this morning for our nine o'clock classes. Mrs. Powers has spent most of today typing up her notes of what we said, so there hasn't been time to put them into very good shape for tonight's talk. They have, however, been arranged according to the different divisions of civil engineering, and the speaker is identified by initials for each statement recorded.

It is difficult to know where to begin, but since it all happened because we were transported 25 years into the future, let's start with transportation engineering. I'll have to follow my notes pretty closely on this:

- J.B.B.* Look! What a relief! They've still got railroads! But what's that long thing that looks like a caterpillar stretching across the state of Ohio?
- A.J.B. It's a conveyor belt. Looks like they're hauling ore to the Great Lakes.
- T.W.L. Hold it! Let's look at that open field again! I thought so! It's an airport now! They've just sprayed it with calcium acrylate!
- A.J.B. Let's tune in on Boston. I want to see how the traffic situation is. Say, look at those cars go! They've really gone to town on those superskyscrapers! And look at all those multistory parking garages! No more parking on the streets!



- J.B.B. And look how they've developed the subway system and the big parking areas at their terminals in the suburbs! That's certainly keeping a lot of cars out of the city!
- A.J.B. I see they've added another tube to Sumner Tunnel and the East Boston skyway's still there. Let's look at the airport.
- R.J.H. It isn't an airport any more; it's a rocketport now. Look at those launching devices for the transatlantic rocket ships! What's that big one at the far end of the field? The sign says: "Restricted - Operation Polaris"! I wonder what that is?
- A.J.B. Did you see the terminals of all those pipe lines? I noticed that they had a lot of pipe lines all through the Middle West. I guess most fluids are being carried that way.
- J.B.B. They'll never put the railroads out of business!
- A.J.B. Maybe not, but look at those trailer trucks! I guess they've grabbed most of the interurban business! No wonder! Look at all those super-highways! Aren't they beauties? All dual lane and limited access. Looks, too, like they've gone in for black-top in a big way - at least here in New England.
- T.W.L. That isn't black-top, Professor, it's calcium acrylate!
- J.B.B. No, it isn't. It's rubber!
- A.J.B. That's utterly impossible! Why, just last week I proved conclusively that it would never be economically feasible to surface roads with rubber!

*See reference key at end of article, page 260, for full names and titles.

J.B.B. Maybe so, but there it is! What I want to know is: where did they ever get all the civil engineers to build all these things?

A.J.B. And where did they get the money?

Before leaving the subject of transportation engineering, I would like to add a few comments of my own. It was apparent that the spheres of operation for the different modes of transportation were becoming more clearly defined. Thus the long haul of heavy solids (with the accent on speed), was dominated by the railroads on land and by ships at sea, while the long haul of fluids, especially on land, was accomplished by pipe lines. For the long haul of passengers and of lighter goods, air transportation held practically a monopoly whether over land or sea. For shorter hauls, however, whether of heavy goods, light goods or passengers, the motor vehicle led the field, with two important exceptions: namely, the transportation of heavy solids by conveyor belts along lines of exceptionally heavy traffic, and of passengers by rapid transit systems in congested areas.

This clarification of function, together with applications of new technological developments, had led to transportation that was not only faster and more comfortable, but most important of all, less expensive. This had contributed effectively to raising the standard of living, not only because it reduced the cost of the distribution of goods, but because better transportation, together with better systems of communication, made it practical to co-ordinate business and industrial activities at locations some distance from each other. This had added momentum to the current trend toward decentralization of our cities, with the result that more people could live, work, and play in areas that were less congested. And behind all this, the civil engineer played the important role of providing the basic ground facilities for transportation — a service so vital that it touches on every sphere of human endeavor.

But let's get back to the Paynterscope and my notes, in which the next general heading is Hydraulic Engineering:

A.T.G. Look at that string of hydro plants along the Connecticut River! You wouldn't think there was enough head on them to make them pay!

J.W.D. More efficient hydraulic turbines and hydraulic structures — that's the answer; not so much lost head. They're using the water to better advantage. I guess they have to. After all, the supply of water is limited.

A.T.I. That's why there's so much emphasis on multi-purpose river development. It isn't just power. Look how they're combining power, flood control, irrigation, water supply, and to some extent navigation.

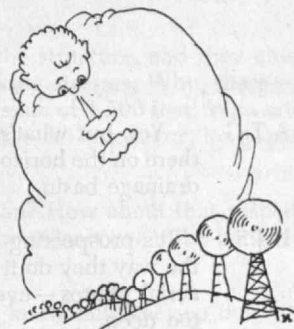
H.M.P. There's an atomic energy plant. They're generating nuclear power as a by-product, but nuclear power doesn't seem to be too important in the whole power picture.

A.T.G. No, it's too expensive. It's used more for special applications where price is secondary — sub-

marines, for instance. It hasn't had much effect on water power. Did you notice how they're diverting water from one drainage basin to another? They don't seem to think anything of that, do they?

J.B.W. Or of backing up their hydro plants with wind power. Did you see those batteries of wind turbines all through the mountains of New Mexico?

A.T.I. They're conserving their coal and oil, and that's why they're developing so much hydro and wind power. But I want to know what's going on in the rest of the world. Let's look at Africa. How about it, Hank?



H.M.P. Righto! Just a minute, now. Here we are!

A.T.I. I guess you didn't hear me. It's Africa I wanted.

H.M.P. This is Africa. You just don't recognize it!

A.T.G. Sure, it's Africa. Look at all those hydro plants along the Congo River! Now, that's *really* worth waiting for!

D.R.H. What's happened to the deserts? Most of them are under cultivation! That's what I call irrigation!

H.J.S. They must have changed the chemical content of the soils and added organic cultures, or they couldn't grow crops in the deserts, even with plenty of water. And they must be dealkalizing and desilting the water so that the soil doesn't get salty and clogged. If I didn't see it, I wouldn't believe it!

R.E. Nothing to it, Herman. They run the irrigation water through treatment plants — just a little problem in sanitary engineering.

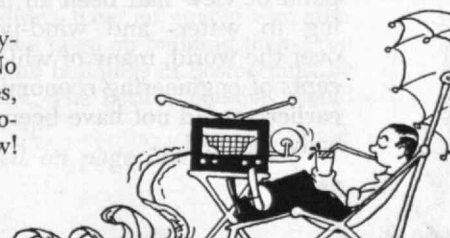
A.T.G. The hydrologists are working with the meteorologists, too! I always said they would come to it! Look! They're making artificial rain over the drainage basin of the Nile!

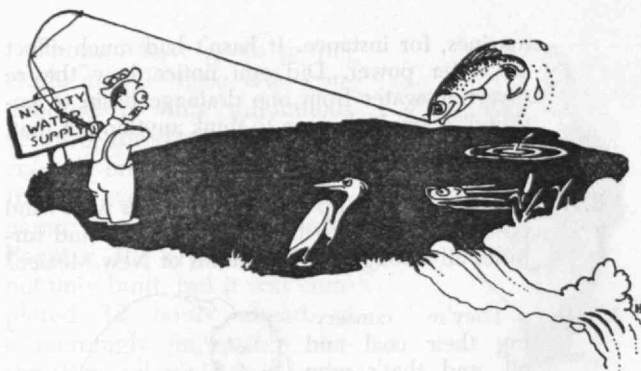
H.J.S. It's a good thing that they're doing all this; with its big population the world would be underfed if they didn't. They need to grow food under practically every condition of climate, and they're doing it.

A.T.I. Drainage is important, too! See how they've drained that jungle, and put it to crops!

A.T.G. There's a river that hasn't been developed yet. Looks like they're just getting around to it. What are those airplanes doing up there?

H.J.S. They're surveying the site! No more plane tables, boys. It's all photogrammetry now!





A.T.G. Yes, but what's that airplane doing 'way over there on the horizon? That one isn't even over the drainage basin.

H.J.S. It's prospecting for gravel for the dam. That's the way they do it now. You can spot it from the aerial photos — even subsurface gravel, if it isn't too deep.

J.W.D. They seem to be blasting down by the dam site. That's funny — there isn't any rock down there.

D.W.T. That's a seismic investigation of subsoil conditions. And just when I'm getting my new boring device perfected!

J.B.W. Down there where they're starting to build the first dam — what's that chap doing sitting by that radio?

H.J.S. That's not a radio. It's an automatic electronic surveyor. It's giving them lines and grades for the dam. See that fellow up on the spillway? He's the rodman — only he doesn't carry a rod any more. See how he's holding that electronic target?

There are more notes here, but time is short, so I'll try to summarize them. Africa had indeed become the breadbasket for Europe, and in this great conversion, American capital, initiative, and the skill of hydraulic engineers had played major roles. With growing populations it had become necessary to grow food under all conditions of climate, and water was, of course, the key to this situation. Our hydraulic engineers, benefiting greatly by advances in aeronautics, oceanography, and meteorology, had so increased their skills in both hydraulic design and hydrology that water, one of our most basic natural resources, was being conserved in the true sense; that is, it was being used wisely in serving the needs of mankind. And they were doing this in a manner such that topsoil — that thin upper crust of earth upon which the food supply of the world depends — was conserved and used, rather than swept into the sea by erosion and floods. More extensive development of water power and the rapid growth of wind power was also important in connection with the conservation of nonrenewable fuels. This long-range point of view had been an important factor in leading to water- and wind-power developments all over the world, many of which, by the narrower concepts of engineering economics so prevalent 25 years earlier, would not have been considered as economically justified.

I have separated sanitary engineering from hydraulic engineering in my Paynterscope notes, because while the former has much to do with water, it is more concerned with those biological and chemical processes by which it can be made to serve the needs of mankind more effectively. Under this heading, the following comments may be of interest:

R.E. What I want to know is: Are the sanitary engineers really on their toes so that they appreciate the importance of the basic sciences, or have the chemical engineers taken over some of the fields?

C.N.S. Stop worrying, Rolf. The sanitary boys are right on the ball! See how they're treating all those industrial wastes? That's a really important part of sanitary engineering, now.

R.E. You're right, Clair. Thank goodness for that! See how they're treating the discharge from that atomic-energy plant! And at that film manufacturing plant they're treating the water *before* they use it, to get rid of any trace of radioactive substances.

W.E.S. The hydraulic engineers can't take all the credit for conserving our natural resources. Don't those streams and lakes look fine? No more pollution!

M.P.H. That's wonderful for the health of the public.

C.N.S. And for recreation, too. I wouldn't mind getting out my rod right now, and trying for a trout in that stream. And swimming! The Charles River didn't used to be fit to swim in.

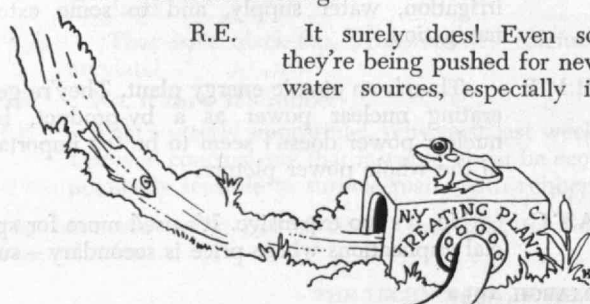
W.E.S. Those water-treatment plants on the Hudson don't look very big.

C.N.S. They don't have to be big. They're using new processes that are a lot quicker. They handle the water at such a high rate that the plants can be small.

R.E. That's important, because they don't cost as much. That's why they can afford so many of them. Look, practically every town is treating its water!

W.E.S. That goes for sewage plants, too. They're certainly using faster methods of treatment. Say, there's an interesting thing! Notice what they're doing with the sludge from the sewage plants and the refuse from the cities. They're not burning up the organic matter any more; it's all being used for fertilizer! And the effluent isn't being dumped into the ocean; it's either being used for irrigation or being pumped back into the ground to raise the ground water level! That ought to help relieve the water shortages!

R.E. It surely does! Even so, they're being pushed for new water sources, especially in



the big cities. Look at those new plants along the shore on Long Island! They're treating sea water chemically and using it to help out the water supply for New York City!

W.E.S. I wonder if they've done anything about corrosion? We used to lose a lot of our water through leakage.

C.N.S. They certainly have! The treatment plants almost all include one treatment to make the water noncorrosive, and everywhere else the pipes are lined with special plastics!

I think that these remarks will give you a good idea of the future of sanitary engineering, but I'd like to stress a few points. The major advances had been achieved as a result of basic research in biology and chemistry, and had led to new methods of treatment that were both rapid and economical. Speed of treatment was especially important since this led to much smaller treatment plants, which, being cheaper to build, had become economically available to almost every city and town for both water and sewage. This was equally important in the field of industrial wastes, since industrial plants were more willing to attack this problem voluntarily and it had become less necessary to resort to legislative pressure. In this connection, the reclamation of by-products from industrial wastes — often leading to financial returns that exceeded the cost of treating the wastes — was a noteworthy factor.

The sanitary engineer had without doubt become a key figure in the battle to conserve our natural resources, not only by helping to use our water more effectively and reclaiming for re-use the solids from both sewage and industrial wastes, but by cleaning up our lakes and streams, leading to larger crops from our wildlife, as well as greatly improved recreational facilities.

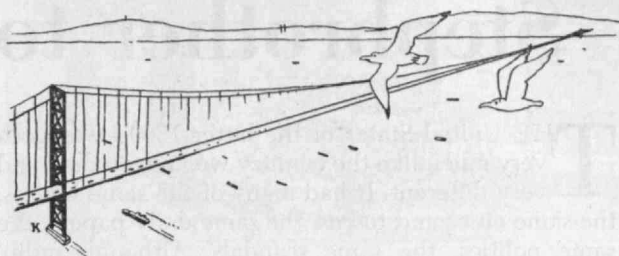
Let us return for the last time to my notes; this time for structural engineering, including foundation engineering. Of course, many of the structures we saw on the Paynterscope had been built in connection with transportation engineering, hydraulic engineering, and sanitary engineering. Yet, for convenience, I have grouped the following remarks into a separate section.

E.M. That railroad bridge seems to be welded. I guess they aren't worried about the effects of impact loads and stress reversal on welding any more.

C.H.N. Yes. Practically all the metal structures are welded — even that aluminum arch!

E.M. Aluminum? It looks as though the price must be way down. Probably the wartime aluminum capacity has led to that. But notice the lighting on that elevated expressway. Continuous fluorescent lights along the handrails, isn't it? And aren't they using radiant heating in the floor slabs to melt the snow and ice?

M.J.H. Yes, they are. And notice that it's a concrete viaduct. Prestressed concrete, too. Look at the length of those spans! They've certainly cut the



dead weight out of the structure, and they must be using higher working stresses. Why, there's a concrete arch with a span of 1,500 feet! Who said that concrete couldn't be used for long-span bridges?

J.M.B. You call that a span? How about that suspension bridge? It must be at least two miles between the towers!

M.J.H. It is! But do you know how they've done it? The cables are spun of glass threads. They're stronger than steel and they are working stresses of a quarter million pounds to the square inch! They're using glass cables to prestress concrete, too!

E.M. Look at that continuous cantilevered Vierendeel truss with the inverted spandrel arch stiffening trusses! What an idea for the final exam in 141!

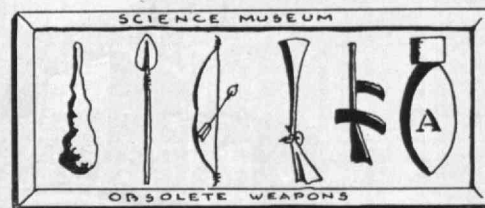
M.J.H. Those thin shell concrete domes are even better! The boys could never figure out one of those. I couldn't even do it myself! Those domes must be at least 1,000 feet in diameter, and they aren't over six inches thick at the crown. Talk about your eggshell construction! I'll bet they're prestressed!

C.H.N. And the thin rectangular dome roofs on those industrial buildings. They must have a clear working span of at least 500 feet!

E.M. Have you noticed that most of the industrial buildings are single-storied? That must be partly on account of decentralization and using lower cost land.

J.B.W. And that must account, too, for the fact that there aren't more skyscrapers. That 150-story building on Manhattan is a corker, but on the whole the other buildings aren't much higher than we build them today.

R.J.H. I noticed five heavy buildings in Boston that must have been designed to resist A-bombs, but I'm surprised that there aren't more of them.



J.M.B. Maybe they didn't have an atomic war after all, and didn't have to go on building them. You know those A-bomb buildings in Boston must be on piles to bedrock. The Boston blue clay would never hold them up!

(Continued on page 254)

Stepbrother to the Iron Horse

THE United States of the latter 1880's was both very much like the country we know today, and very different. It had many of the same houses, the same cities and towns, the same daily papers, the same politics, the same scandals. Although radio, movies, and television were only fantastic dreams, today's jokes were heard in the variety shows, and the dramatic companies, at the local opera house, used the same plots we now witness. Running water was available in cities and in the larger towns, and telephones and electric lights were coming into general use.

To outward appearances, at any rate, the biggest difference between the nation of 1952 and that of seven decades earlier was in local transportation. In the half century, from 1830 to 1880, the railroads had grown from a few small beginnings to a network reaching every worth-while town in the nation, and canals and stagecoaches had declined to insignificance. Nevertheless, local public transportation was pretty much limited to the larger cities, and was slow and fairly expensive. Private transportation, by horse and buggy, was a necessity for the farmer, but it was still a luxury for townspersons, even the more prosperous ones.

The horsecar had gotten its start in New York in 1832 as a downtown extension of the New York and Harlem Railroad. For nearly 20 years, this one line plodded along, and then suddenly, in the 1850's, a craze for horsecars swept the larger cities. Economic reasons were partly, if not largely, responsible for this trend, for, on a track, a horse could haul about twice the load that he could pull over rough cobblestones or rutted dirt roads. But the spirit of the times also contributed to this new mode of transportation, for the iron horse was revolutionizing the way of life

throughout the entire country, and anything that ran on rails simply had to be good.

Although the horse was slow, of limited power, expensive, and short-lived, many people held it to be axiomatic that no mechanical contrivance could ever improve on him. Yet the inventors kept striving.

In meeting the transportation needs of the day, a few hardy pioneers turned to steam power, which was tried and proven. On street railways, they used miniature locomotives called "steam dummies," disguised like cars so as not to scare the horses. Although effective, the steam cars were smoky, noisy, and expensive. Out of San Francisco, daring Andrew S. Hallidie conquered the steep hills by using a stationary steam plant to move an endless cable in a slot between the car rails and equipping each car with the gripper which allowed it to take hold of the cable or to release it as desired. Cable cars were economical to operate, quiet, clean, and somewhat faster than horsecars, and these advantages outweighed the objection of high initial cost. Consequently, in the last quarter of the Nineteenth Century, lines were built and cars operated in New York, Chicago, Philadelphia, St. Louis, Oakland, Denver, Washington, Kansas City, Cleveland, Providence, Seattle, Baltimore, Brooklyn, Los Angeles, Hoboken, and Omaha.

From Horsecars to Electricity

Meanwhile, other inventors were experimenting with that invisible, imponderable, exciting form of power known as electricity. Some inventors employed the heavy, bulky storage batteries as the source of motive power without much success, while others transmitted power by overhead wires with which the cars made contact as they moved. There is much

dispute as to whether Leo Daft, Charles J. Van Depoele, Frank J. Sprague, or Elihu Thomson produced the first successful electric car. It is conceded, however, that the 40 cars Sprague equipped with motors at Richmond, Va., in 1888 constituted the first large-scale electric railway operation.

At that time the country's largest street railway was Boston's West End system, which then owned 8,000 horses. In 1889, following his Richmond installation, Sprague came to Boston to install a street railway system run by electric power. The same year, the Thomson-Houston Electric Company,

Along Pennsylvania Avenue in Washington, D. C., a heavily coated motorman in open vestibule operates a closed car with glass windows for the Capital Transit Company. A solitary passenger occupies the second car which is open. Arc lights and Oliver typewriters were in vogue when this photograph was made.



During Their Heyday, between 1880 and 1915,

Trolley Cars Supplied Interstate Transportation

by Railway Systems of Interconnecting Networks

By HENRY B. BRAINERD

In New York's Battery Park district, a jaywalking pedestrian decides to watch out for traffic, after narrowly escaping being run down by a four-wheel horsecar of the Belt Line which operates between South Ferry and Central Park with a crew of two.

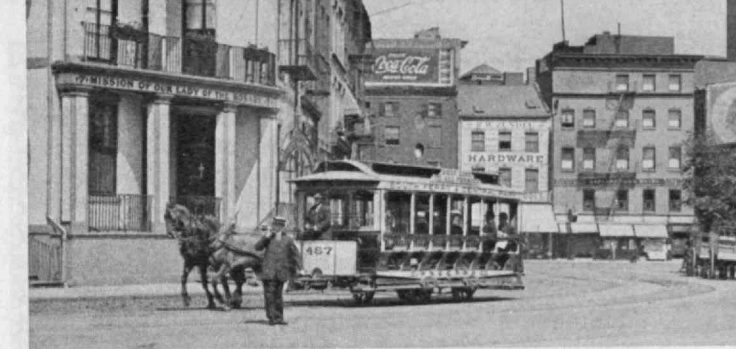
which had bought out Van Depoele and combined his inventions with Thomson's, installed their electric system on a West End line in Cambridge.

Significance of Street Railways

That marked the turning point for electric traction. In 1890, a survey by the *Boston Advertiser* showed, there were 60 cities with trolley lines either in operation or under construction. From then on, the growth of electric trolley systems continued to be rapid. Soon every city of any size had its trolley system, and suburban and rural lines were extended and interconnected until it was possible to travel long distances without resorting to "steam cars."

The network of urban and suburban lines, which sprang into being toward the end of the Nineteenth Century, ushered in a new phase of public transportation over moderate distances which had important social and economic significance. The importance of this development has not always been sufficiently appreciated, nor has it been properly understood; certainly, it has not been adequately chronicled. Nevertheless, this technological development opened up, for the first time, the possibility of suburban living even though the full impact of suburban life was not to be realized until decades later when the automobile became commonplace. With interurban lines operating between towns and extending into the country, the city dweller could be freed from the restricted confines of the metropolitan area. Now the poor man could ride many miles to the beach or to the picnic grounds for only a nickel, and he could arrive at his destination more quickly and comfortably than the rich man in his carriage.

The power plant of a typical early line consisted of one or two 500-volt, direct-current generators belt-driven by reciprocating engines. Each unit was usually rated at no more than 100 horsepower. Power from the generating station was transmitted either via feeders or directly by the trolley wire to cars each carrying one or two 15-horsepower motors. In the Sprague system, the motors were controlled by a drum switch at either end of the car, connecting to resistor grids underneath, while the Thomson-Houston system provided a circular rheostat some three feet in diameter, with a chain-and-sprocket connection to a hand crank at each end. However, the Thomson-Houston rheostat soon disappeared. Speeds of 10 to 15 miles per hour were typical.



Sometimes the cars were horsecar bodies mounted on electric motor trucks, but more often they were newly built for the job, being somewhat larger than the horsecars, but of the same design. The typical closed "box" car for cold weather had only four wheels, seats facing lengthwise, end platforms open to the air between the waist-high dash, and the overhanging roof, and a body that curved inward below seat level. The curved sides were a last vestige of the stagecoach, which had to be wide at seat level but narrow between the wheels. For summer, there were open cars with benches clear across the width of the car and a running board along the full length of each side, as shown above for the horsecar.

With different types of cars for summer and winter use, a trolley line had a double investment in cars. Perhaps the extreme in the large number of cars used for a small system was reached in the Newton Street Railway. This line ran three cars, and in rush hours, a horsecar would be coupled behind each motor car. A spare car was needed of course, so rolling stock of this line consisted of four box cars and four open motor cars, four box horsecars, and four open horsecars, and "one old horsecar used as a sand car." Hence, a total of 17 cars was employed to support operations which did not normally require more than three cars at a given time.

Track construction had made great strides since iron straps on wooden stringers sufficed for the first horsecars. On paved streets, the 1890 trolley ran on a six-or-seven-inch girder rail weighing around 80 pounds to the yard, with a groove or a step for the flange. For unpaved roads and open right of way, the track was usually a 40-to 50-pound T rail of the American Society of Civil Engineers standard section.

Although it had not been successful for traction, well-informed people believed that the storage battery would soon be improved sufficiently to warrant its satisfactory use in vehicles. About 1894, the promoters of the Newton and Boston Street Railway argued that their line should be allowed to use wooden poles to support their trolley wire instead of the more expensive iron poles, because by the time the wooden poles were worn out, practical storage batteries would be available, and then the trolley wires would be taken down. Hope for better primary batteries was not dead either. As late as 1897, a civil engineer, building Boston's South Station, remarked that the locomotive of the future would use "a lump of zinc the size of your fist" as a day's fuel supply.

Railroad Empires in Miniature

Trolley systems of the 1890's were railroad empires in miniature. They had the same cutthroat rivalries — political and financial — and much the same romance. Steam-railroad men had a good-natured contempt for trolleys, though when a suburban line competed with established steam service, this became bitter animosity. But trolley men referred to their occupation as "railroading" with every inch of pride that the word could carry.

By 1900, the trolley car was firmly established as an important means of passenger transportation. True many outlying lines were not yet paying, but the number of street railway passengers was doubling every 10 years, so it was thought to be merely a matter of time before accounts would be kept in black ink instead of red. In the cities the major problem then — as now — was how to handle the crowds. Most companies operated the larger cars with two four-wheel trucks by 1900, but even these were not big enough for all the passengers who wanted to ride. About this time, enclosed vestibules and air brakes were generally adopted, and the newer closed cars were built with squared-out sides and cross seats. Car speeds were usually 20 miles per hour and might reach 25 or 30 miles per hour. In Boston there had been a perpetual traffic jam of trolley cars, relieved only by the opening of America's first subway, under Tremont Street in 1897. With two or even four 40-horsepower motors per car commonplace by 1900, power demands were larger than a decade earlier, and generating capacity had been increased accordingly. Alternating-current power, transmitted at high voltage to converter substations, was being tried here and there. Capital and labor costs for converter stations were about as much as that required for steam stations, and the large

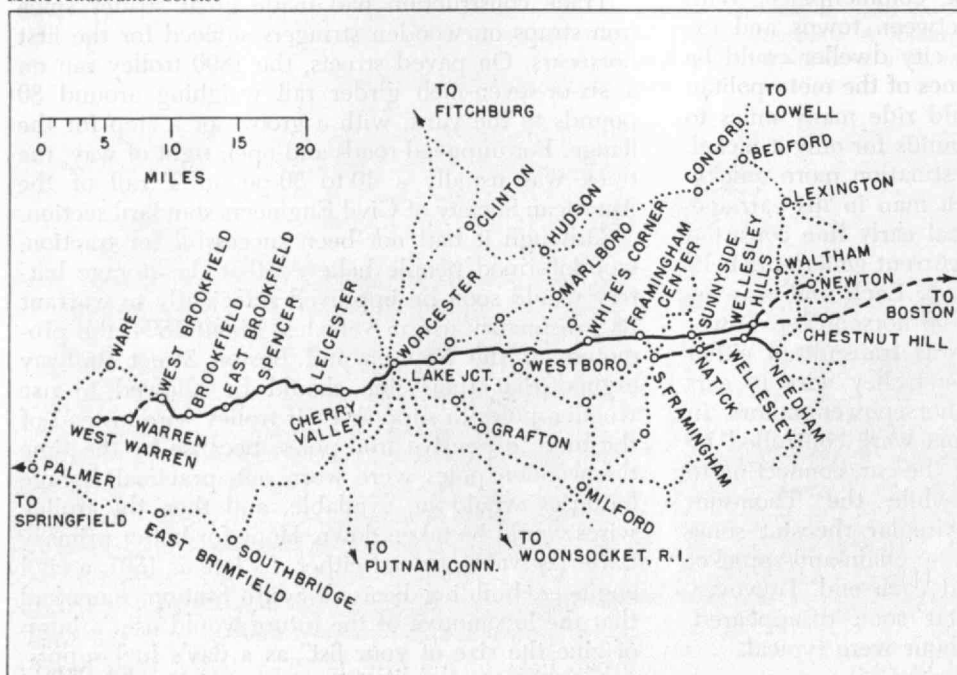
capital cost of transmission lines offset the small saving which better fuel efficiency in the large central station afforded.

About the turn of the century, electric railway construction shifted from the city to the country, and the next 15 years saw the completion of an extensive network of long-haul, high-speed, interurban lines. The most extensive of these was the network extending from mid-New York State to St. Louis, Chicago, and Milwaukee, but other similar lines made connections between such points as Boston and Worcester, Philadelphia and Allentown, Los Angeles and San Bernardino, Ogden and Salt Lake City, and Atlanta and Stone Mountain. These lines made use of existing trolley tracks in the cities and often built their cross-country rights of way to the same standards as a secondary steam railroad. So far as the curves and clearances of city **trackage** would permit, the interurban cars likewise approached steam railroad standards of size, weight, comfort, and appearance. Steam railroad developments in the use of steel, first in underframes and then for entire cars, were promptly adopted for interurban and for new city cars. Motor sizes increased with car weight. Speed between towns was seldom less than 30 miles per hour, and top speeds up to 60 miles per hour, were not uncommon.

The improved efficiency of large generating plants led to the general use by interurban lines of alternating-current transmission. Power was usually generated at 25 cycles, and transmitted to substations where it was converted to 600-volt, direct current and fed to trolley lines. A few lines used 1,200 to 1,500 volts direct current with heavily insulated motors in series pairs, and a few others used 25-cycle traction motors. But the majority stuck to 600-volt direct current, for which standard equipment was readily available. Most of the high-voltage and alternating-current lines had their cars arranged to use 600-volt direct current within city limits.

Map of the route between Needham and West Brookfield, Mass., which could be traveled entirely by trolley rides in 1914. Automobile highways traverse essentially the same route.

M.I.T. Illustration Service



Trip by Trolley

At the height of trolley railway systems, it was possible to make fairly extensive trips on interconnecting street railway systems. The Bay State Street Railway was the giant among trolley systems with a network of more than 900 miles of track between its farthest southern point at Newport, R.I., and its farthest northern point at Nashua, N.H. Few persons utilized the full mileage of such systems in a single trip, but shorter trips were exceedingly common and provided week-end diversions.

To visualize travel by trolley as it was at its height, let us turn back the calendar to 1914 and make an imaginary trip between two modest Massachusetts towns, Needham and West Brookfield. For purposes of orientation, it may be well to recall that Needham is just beyond the outskirts of Boston, while West Brookfield is 22 miles west of Worcester, so our trip will cover a distance of 57 miles, along the route marked by the heavy line on the accompanying map.

In Needham Square we board the car of the Middlesex and Boston Street Railway (a merger of the suburban lines west of Boston) for Wellesley. The bright yellow car is a tiny, old four-wheeler, and is far from full. Two things have contributed to the lightness of travel on this line; people tend to travel toward and away from Boston rather than between towns at about the same distance, and new houses, which would support heavy traffic on the line, have not been built to the extent expected. In time the conductor comes through the car, collects the \$0.06 fare, and issues a punched transfer enabling us to continue our journey on this line to Wellesley Hills. The four-mile trip from Needham Square to Wellesley takes slightly more than 15 minutes. About half of the way, the track runs on the right side of the street, then it crosses to the left side for the remainder of the distance. This is typical of country trolleys.

At Wellesley, we have only a few minutes' wait for the car from South Framingham to Newton. It is the same bright yellow, but a much bigger car than the one in which we just rode. It was built in 1902 for the Boston Suburban Electric Company when they bought up the local lines which they merged to form the Middlesex and Boston in 1907-1908. The conductor comes to our seat to collect our transfer for, in the earlier days of streetcar transportation, it was possible to walk through a car; one might even get a seat. By 1914 many city systems had adopted a pay-as-you-enter fare collection, but this method had not spread to the Middlesex and Boston Street Railway. After five minutes, and a mile and a half of roadside single track, we make a sharp turn across the street and enter the Wellesley Hills turnout. This is the longest distance between turnouts on the whole line, and with a car every 15 to 20 minutes in each direction, it is a frequent source of delay.

It is in Wellesley Hills that we change to the Boston and Worcester Street Railway, commonly known as "the Trolley Air Line." This double track interurban line follows the direct but hilly route of the old stagecoach turnpike. The dark, olive-green cars run frequently. We board the first car, a Worcester local. The conductor comes to our seat, collects our through fare to Worcester, which is \$0.47, and punches a check to identify how far we have paid. This will also serve as our transfer to a Worcester Limited.

In traveling through the New England countryside, we note a picnic grove, which is a favorite destination for Sunday car riders, and a few houses built to take advantage of this good transportation which has been available since 1903. At Natick Junction, the car behind us will turn off, then at Sunnyside we stop for passengers as we cross the Natick and Cochituate branch of the Middlesex and Boston Street Railway, originally a horsecar line built in 1887.



Keystone View Company

Then, as now, slogan of operators of New York's street transportation system evidently was "always room for one more." Now, however, in contrast to this view of an earlier day, it is hardly feasible to ride on the outside of the car.

After two or three miles of open country with hardly a house to be seen, we stop at Framingham Junction, where the Framingham-Saxonville Branch crosses the main line. The two-story headquarters of the Boston and Worcester Street Railway, a few houses, and the State Militia Muster Grounds are passed. At Framingham Center we pull into a side track in front of the big carbarn, alight, and walk over to the main track, where we wait only a few minutes for the Worcester Limited. This car left Park Square, Boston, an hour ago. For the first six miles it was operated by a crew of the Boston Elevated Company, but operation for the Boston and Worcester Railway Company took over at Chestnut Hill and brought the Worcester Limited 14 miles without a stop in 25 minutes. We pass through the village of Framingham Center, which was the original settlement in Framingham. When the railroad was built through South Framingham, the Center declined in importance. Now the trolley is bringing back a moderate amount of business.

On our left is the Union Avenue Branch connecting South Framingham to the Center. This and the Saxonville line were formerly the Framingham Union Street Railway, a horsecar system built in 1886 and not electrified until 1897, when James Shaw bought control as a preliminary to building the Boston and Worcester line.

The schedule between Chestnut Hill and Worcester on the 31 miles of track of Boston and Worcester lines is 62 minutes, with only three stops. Soon after leaving Framingham Center, we pass the Sudbury Reservoir and stop at White's Corner. Most of the way from White's Corner to Worcester is much like that of a steam railroad except for steeper grades. A passing eastbound freight car is a reminder that the Boston and Worcester Railway does not handle steam railroad freight cars like many of the interurban lines of the Middle West, but it does handle



Fred Wagner Studios

Long after the streetcar reached its heyday, fast, quiet streetcars were introduced on the Madison Street line in Chicago, but the automobile had replaced streetcars for suburban travel.

through shipments with connecting trolley lines as far as New Bedford and Springfield. Two important items of freight are beer and fresh fish.

The next stop is at Lake Junction, where the crew of Worcester Consolidated Street Railway takes over the car for the last three miles. The conductor exchanges our identification check for a free transfer, good anywhere in the Worcester local-fare zone. Soon we pass White City, the amusement park built by the Worcester Consolidated, with its roller coaster and many other attractions. Then on into Worcester.

As we approach the center of the city, other tracks come into ours, and we find ourselves in a veritable procession of trolleys. Most of the lines we see are double track. The Worcester Consolidated Street Railway is the third largest trolley system in Massachusetts with well over 300 miles of track. It operates through cars to Fitchburg, Springfield, Putnam, Conn., Woonsocket, R.I., and many nearer points, as well as a network of city lines in Worcester. This system, along with the Springfield Street Railway, the Berkshire Street Railway, the Rhode Island Company, and the Connecticut Company, is controlled by the New York, New Haven and Hartford Railroad. Cars of these companies are of the same color scheme — light yellow body, white trim, and red lettering.

We pass the railroad station where the long-haul trolleys of the Worcester Consolidated have their terminal, then come to the end of our run at Salem Square. A quick lunch can be obtained at the lunch counter in the waiting room. A short walk through City Hall Park and across Main Street brings us to the southbound stop on the final leg of our journey through Spencer, Brookfield, and West Brookfield. A dozen cars go by before ours comes along, marked "Spencer." The transfer we received at Lake Junction

will permit us to travel to the city limits of Worcester without additional charge. At the outskirts of Worcester we notice a single track going down a side street to a building like a small carbarn. This is the factory of the American Car Sprinkler Company which builds trolley cars for sprinkling or flushing streets and leases them to railways over a large part of New England.

At the city limits, where the local cars marked "Leicester Line" turn back, we go from double track in the center of the street to single track at the roadside. Soon we pass the village of Cherry Valley, then the hilltop town of Leicester, and on to the next town, Spencer. Our progress is slowed by long climbs, cautions descents, and waits at turnouts. It takes us an hour to reach Spencer, and the fare is \$0.15 after leaving the local zone covered by our transfer. In Spencer our car stops in the middle of the street at the end of the line.

The waiting car of the Worcester and Warren Street Railway takes us on the final stage of our trip. The Worcester and Warren Street Railway is a small independent line, running from Spencer through the Brookfields to West Warren. After another hour of hill climbing, with several turnout waits, and the payment of three additional \$0.06 fares, we arrive at our destination, West Brookfield. The 57-mile trip from Needham to West Brookfield has taken four and a half hours and has cost \$0.86.

It is possible to go on to Springfield by taking the Ware and Brookfield Street Railway to Ware, and then the Springfield Street Railway through Palmer. But most of the through riders go by the route farther south where the Worcester Consolidated and the Springfield Street Railway run through cars via Southbridge and East Brimfield. It takes three and a half hours to cover the 60 miles; this is said to be the longest regular trolley car run in New England. It was also possible to go from Boston via Worcester, Springfield, Hartford, Waterbury, and on to Bridgeport, and then return by any of the several different routes such as that of New Haven, New London, Westerly, and Providence. Special cars have made much longer runs, however, such as from Boston to New York for example.

The vast network of urban and interurban electric street railway systems (which were in extensive operation when World War I broke out in Europe) provided passenger transportation service which very well supplemented that offered by the steam railroads. For a decade or so the electric railways filled a growing need for personal transportation which was improved upon only when the private automobile became commonplace, and so long as they filled a social and economic need, they enjoyed their heyday — a precarious heyday for smaller rural lines.

Decline Sets In

Urban and suburban electric railway systems reached the peak of utility between 1900 and 1915. The beginning of World War I marked the end of large-scale trolley construction. Costs were rising while income from fares remained stationary.

(Continued on page 270)

The Renaissance in Metal Cutting

The Trade-School Approach to Machine-Tool Operations Is Giving Way to Scientific Analysis as Instrumentation and Analytical Methods Provide Fundamental Understanding of Operations

By MILTON C. SHAW

ALL basic fields of industrial endeavor have taken similar paths in the course of their development. The earliest work has generally been carried out on a purely empirical basis, and in many instances such activities have been highly developed by following the case method. While this method presents a clear picture of each specific job, a great many cases must be considered before sufficient examples have been presented to enable all common situations to be covered. This approach has been extensively used in metal cutting as well as in other fields, such as machine design, hydraulics, metallurgy, and even such nonengineering activities as law and medicine. The weakness of the method lies in its failure to provide a direct means for solving problems which lie beyond the range of current experience. Each new case that is established must be arrived at by a costly procedure of trial and error.

Not too many years ago, steam turbines and power machinery were designed largely in accordance with the judgment of the designer, rather than by following the more rational approach, involving stress analysis, that is in wide use today. Similarly, the design of hydraulic conduits and machinery that once was done by rule-of-thumb procedures is now being accomplished largely with the aid of the principles of fluid mechanics. In the field of metallurgy, steel-making is being carried out by considering it a special problem in physical chemistry, instead of employing the ago-old recipe technique. Metal-cutting tools and procedures are still largely established by the old case method. This activity has resisted the impact of modern technology and the scientific method, mainly due to the complexity of the operations, but also partly due to the attitude held toward metal cutting in our engineering schools.

The Educational Position

Traditionally, metal cutting has been part of the training of mechanical engineers in this country. However, in the past, a trade-school approach has generally been adopted, the emphasis being placed entirely upon nomenclature, the mastery of machine manipulation, and the learning of a large number of disconnected empirical rules. In some instances the major objective has actually been the production of trinkets, thus appealing to the hobby instincts of the student rather than offering him a means of exercising his facility to apply fundamental concepts and developing his analytical ability.

In the past, metal cutting has been an almost exclusively undergraduate activity. The extensive graduate research program that is so necessary in supplying the spark needed for effective graduate teaching has been largely missing. There are relatively few people with fundamental learnings who have found their way into production activities due to the fact that students, who are analytically inclined and take naturally to the rational approach to problems, have not been attracted to study metal-cutting operations. This also explains why the production industries, in the main, have not instituted a great amount of fundamental research in the past.

About three years ago it was recognized that a renaissance in metal-cutting activities is just as inevitable as it was in the fields of power-machinery design, hydraulics, and metallurgy. Under the guid-

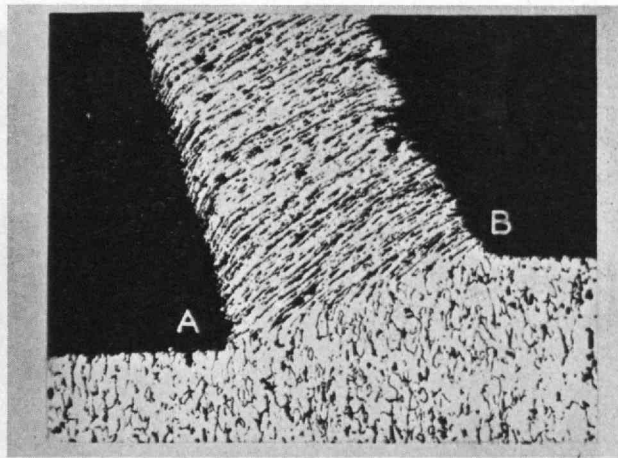


Fig. 1. In the process of metal cutting, tool tip, A, produces chips above the line AB with no deformation of the metal below this line.

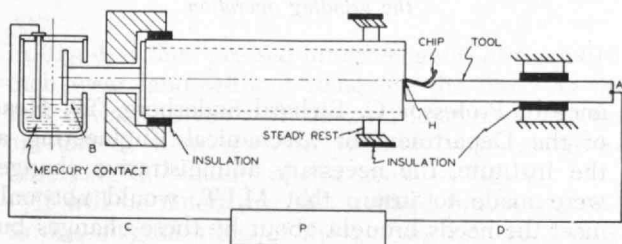


Fig. 2. If the work to be cut and the cutting tool are insulated from the machine, the dissimilar metals at the cutting point, H, may be used as a thermocouple to determine tool chip temperatures.

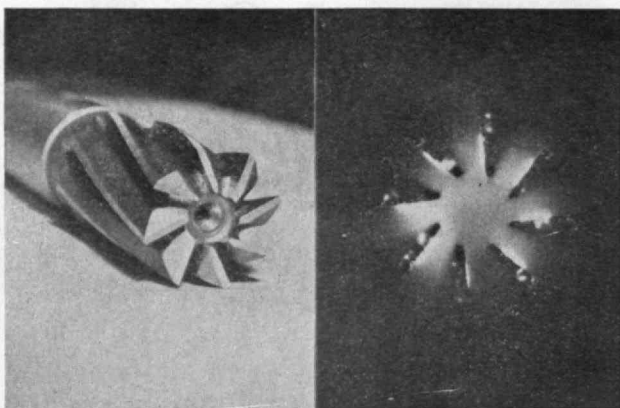


Fig. 3. After cutting a radioactive piece of metal the cutter, (left) was placed on photographic paper to produce the image, (right) proving that metal from the workpiece had been transferred to the mill end.

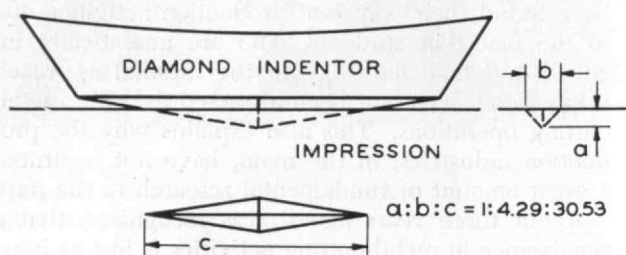


Fig. 4. Diagram of diamond indenting tool used to make impression in cutting tool to determine wear during use.

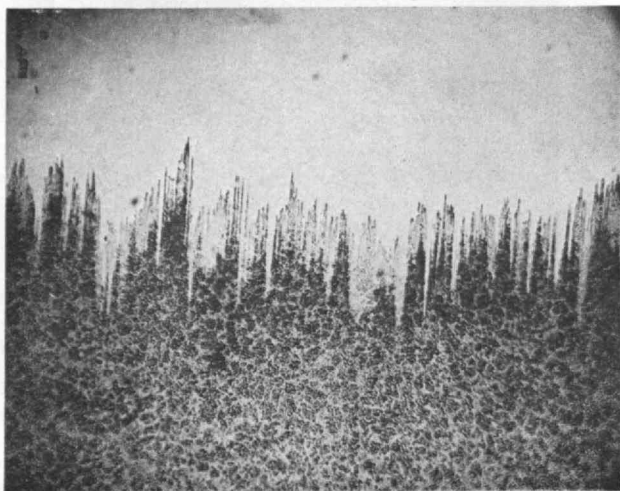


Fig. 5. Photographic reproduction of cutting edge of a ground surface, showing grooves and jagged edge left as a result of the grinding operation.

ance of Professor C. Richard Soderberg, '20, Head of the Department of Mechanical Engineering at the Institute, the necessary administrative changes were made to insure that M.I.T. would not only meet the needs brought about by these changes but would actually be in the vanguard of the movement. Developments which have recently taken place to strengthen the Institute's position in the field of metal cutting may be summarized as follows:

1. **Teaching Program:** The classical introductory matter presented to undergraduate students is being streamlined and integrated with more fundamental information as it becomes available from research laboratories. Here, the objective is to describe precisely what happens in a cutting process in terms of fundamental concepts, and where possible, to make the treatment quantitative. Cutting dynamometers and temperature-measuring techniques are now regularly employed in the undergraduate instruction in Machine Tool Laboratory. A subject dealing with advanced analysis of cutting techniques is now being regularly presented at the graduate level.
2. **New Division:** A Machine Tool and Metal Cutting Division in the Department of Mechanical Engineering has been organized to administer the research and teaching programs in this area. By this action metal cutting is now recognized as a legitimate professional engineering subject and thus takes its place among the other older academic divisions of the Department of Mechanical Engineering, which include: thermodynamics, applied mechanics, machine design, and materials engineering.
3. **New Facilities:** The Machine Tool Laboratory has been recently modernized and many new tools have been added to those already available. A variety of special test apparatus has been assembled and is now in use. Some of these facilities will be mentioned later.
4. **New Building:** Through the generosity of Alfred P. Sloan, Jr., '95, a new Metals Processing Laboratory is nearing completion. In the near future this modern million-dollar structure will house the research and teaching activities of M.I.T. in the machine-tool field.

Research Techniques

A variety of techniques have proved to be valuable in the study of the metal-cutting process. Probably the simplest and most easily applied are those of a visual nature. Direct observation of the cutting process through the microscope, or the study of motion pictures that have been taken through the microscope during cutting, clearly reveals that metal cutting is basically a shear process. When a metal is cut it is plastically deformed very suddenly in shear. A photomicrograph of a partially formed chip is shown in Fig. 1. This picture was prepared by suddenly stopping a tool in the process of making a cut, cutting away the material in the vicinity of the tool point, and polishing and etching the surface following the usual metallographic technique. A sharp line extending from A to B is evident in Fig. 1 which shows that all plastic deformation occurs suddenly in cutting, there being no deformation below AB and no change in the amount of plastic deformation above AB. Cutting is thus seen to be a process that is carried out at very high strain rate. The thickness of the chip, relative to the depth of cut, is a measure of the amount of shear strain to which the metal has been subjected in cutting. As in all deformation processes, this unit strain is a very important quantity. It may be determined by visually observing the ratio of the chip thickness to the depth of cut.

A complete knowledge of the system of forces that obtain at a tool point is also of considerable value. Instruments that enable the resultant force to be resolved into a convenient set of components are called dynamometers. The availability of the wire resistance strain gauge in recent years has made it possible to measure force components precisely without mutual interference between the components. The force and torque components that are read with such instruments during cutting make it possible to determine such quantities as the cutting power, the mean shear stress on the shear plane, and the coefficient of friction between chip and tool face. The cutting dynamometer is one of the most useful tools available for studying cutting operations.

The mean temperature along the face of a cutting tool is of primary interest in basic tool studies. Such a temperature cannot be measured by embedding thermocouples in the workpiece a short distance below the surface, or by following any of the other usual laboratory techniques. Chip-tool temperatures can be measured easily however by making the interface between the chip and the tool the hot junction of a thermoelectric circuit. The dissimilar metals, of tool and workpiece, in contact cause a thermoelectric electromotive force to be generated when the chip-tool interface undergoes an increase in temperature. The method of applying this technique to a metal-cutting operation is shown diagrammatically in Fig. 2. This method was first used by the late Henry Shore, '24, in 1924 and is described in his master's thesis of that year, at M.I.T.

The improvement of tool life is one of the major concerns of the production engineer, and one of the chief reasons for tool replacement is wear. As in other abstract wear studies, the use of the radioactive tracer technique, in which one member of a rubbing pair of metals is made radioactive, has proved of value in tool wear studies. The autoradiograph shown in Fig. 3 of the end mill, also shown in Fig. 3, demonstrates that some metal transfer occurs even under the most advantageous cutting conditions. Here cutting conditions were arranged to be optimum, and the autoradiograph, produced by allowing the used and cleaned cutter to rest on a photographic film in darkness for one week, indicates the presence of significant amounts of metal transferred from the radioactive workpiece. From tests of this sort it may be concluded that even under the most favorable cutting conditions there will be some transfer and build-up of metal from the workpiece onto the cutting tool.

In the shop the wear of a cutting tool is usually followed by noting the rate at which a wear land develops on the clearance face of the tool, but this procedure is slow and inaccurate. Recent experiments in the Metal Cutting Research Laboratory at M.I.T. have shown it possible to speed up tool life studies by use of a diamond impression. The tool to be studied is first provided with a small flat about 0.010 inch wide on the clearance face of the tool, to simulate the conventional wear land. A small amount of cutting will cause this surface to wear in and assume the shape of a naturally produced wear land. A diamond indenter, shaped as shown

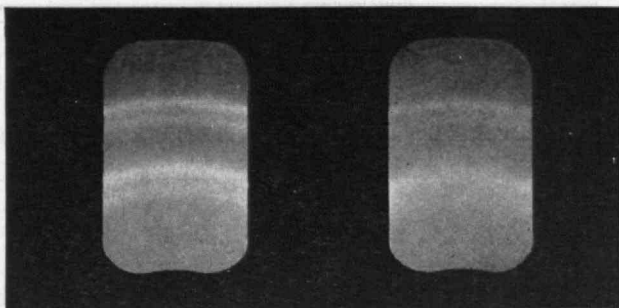


Fig. 6 (Above) Radiography is an effective tool in studies of metal cutting. Refraction pattern of sharply defined arcs (left) are obtained from well-annealed metal. When metal is cold worked, as by grinding, for example, the refraction patterns are diffuse (right).

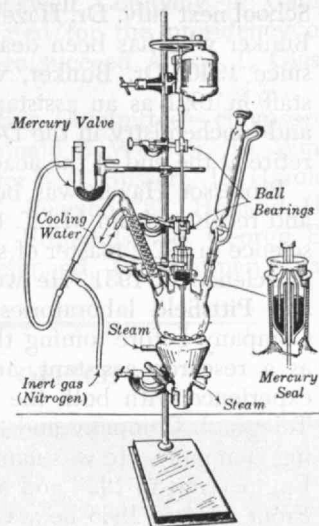


Fig. 7. (Right) Glass apparatus previously used for producing Grignard reagents in a slow and hazardous small-scale operation has now been replaced by a safe, continuous process employing metal cutting.

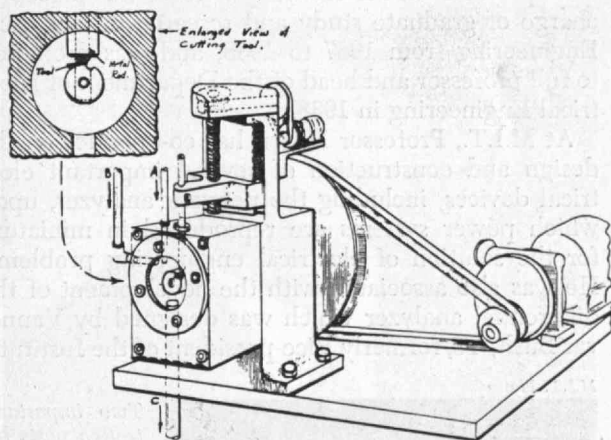


Fig. 8. Apparatus for cutting magnesium in presence of liquid reactants replaces the slower and more dangerous Grignard process illustrated in Fig. 7.

in Fig. 4, is then pressed into the center of the 0.010-inch wear land without removing the tool. As the tool is worn in use and the wear land develops, the amount of wear may be precisely determined by observing the change of distance c in Fig. 4.

It will be noted that this method provides a 30.5 to one magnification of the amount of wear. Inasmuch as the wear rate is found to be linear with time, it is possible to estimate the life of a tool by cutting a relatively small amount of material.

(Continued on page 264)

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

Hazen to Succeed Bunker

HAROLD L. HAZEN, '24, Head of the Department of Electrical Engineering at the Institute since 1938, will become dean of the Graduate School next July. Dr. Hazen will succeed John W. M. Bunker who has been dean of the Graduate School since 1940. Dr. Bunker, who joined the Institute's staff in 1921 as an assistant professor of physiology and biochemistry in the Department of Biology, will retire at the end of the academic year.

Professor Hazen was born in Philo, Ill., in 1901, and received from M.I.T. the degrees of bachelor of science in 1924, master of science in 1929, and doctor of science in 1931. He worked in the Schenectady and Pittsfield laboratories of the General Electric Company before joining the Institute's staff in 1925 as a research assistant, and subsequently obtained experience with both the American Telephone and Telegraph Company and the Raytheon Manufacturing Company. He was named instructor in Electrical Engineering in 1926 and assistant professor in 1931. From 1934 to 1935 he was a member of the faculty of Ohio State University in the first of M.I.T.'s exchange professorships. Dr. Hazen became an associate professor at the Institute in 1936, was placed in charge of graduate study and research in Electrical Engineering from 1937 to 1938, and was promoted to full professor and head of the Department of Electrical Engineering in 1938.

At M.I.T., Professor Hazen has co-operated in the design and construction of several important electrical devices, including the network analyzer, upon which power systems are reproduced in miniature for the solution of electrical engineering problems. He was also associated with the development of the differential analyzer which was designed by Vannevar Bush, '16, formerly Vice-president of the Institute.

M.I.T. Photo



Two important changes in administrative posts have been announced at M.I.T. recently.

Professor Harold L. Hazen, '24, (left) who has been head of the Department of Electrical Engineering since 1938, will become dean of the Graduate School on July 1, succeeding John W. M. Bunker who will retire. Professor Hazen is widely known as a scientist, an educator, and as administrator of the Institute's largest Department.

Professor Ernest H. Huntress, '20, (right) has been appointed director of the Institute's Summer Session, succeeding Frederick G. Fassett, Jr. Professor Huntress has been a member of the staff of the Department of Chemistry for the past 31 years and has been active on various educational committees at Technology.

During July and August of 1951, Dr. Hazen headed the Commission on Engineering Education which visited Japan for consultation with the Japanese Ministry of Education, as well as educators and administrators of engineering colleges there. This commission, consisting of 15 of the nation's leading engineering educators from 12 engineering schools in the United States, was organized by the American Society for Engineering Education and the Unitarian Service Committee, Inc., at the request of the Supreme Commander for the Allied Powers.

Professor Hazen, who was second lieutenant in the Air Service Reserve from 1924 to 1929, and lieutenant commander in the United States Naval Reserve from 1936 to 1949, served during World War II as chief of Division 7 of the National Defense Research Committee. In this post he worked from 1942 to 1946 in the field of ordnance fire control. Dr. Hazen was awarded the Presidential Certificate of Merit, the second highest civilian award, in October, 1948.

The Franklin Institute awarded him the Levy Gold Medal in 1935 for outstanding technical papers, which appeared in that institute's journal, on the theory and design of servomechanisms. Dr. Hazen has contributed notably to the technical literature in electrical engineering, especially in the field of instrumental calculation, automatic control devices, and engineering education. Since 1948 he has been a member of the Advisory Council of the Department of Electrical Engineering at Princeton University, and in 1949 was a member of the panel on Science and Engineering of the Service Academy Board. He is chairman of the Region II Committee for Undergraduate Engineering Curricula of the Engineers' Council for Professional Development, a group which provides the officially recognized list of accredited engineering curricula in the United States, based on inspections by the regional committees.

M.I.T. Photo



Huntress Heads Summer Session

ERNEST H. HUNTRESS, '20, who joined the staff of the Department of Chemistry at the Institute in 1920, has been appointed director of the M.I.T. Summer Session, President Killian announced in January. In his new post, Dr. Huntress will succeed Frederick G. Fassett, Jr. who was recently appointed associate dean of students. Dr. Huntress will continue the development of the Institute's summer program, extending its scope and its service to industry and education. Since 1950 he has devoted a portion of his time to the Office of the Dean of the Graduate School, serving as deputy dean, and he will continue to assist the dean of the Graduate School at M.I.T.

Born in Laconia, N. H., Dr. Huntress received his early education in the schools of Lynn, Mass., and was graduated from Classical High School in 1916. After entering M.I.T. with the first class to occupy the present buildings in Cambridge, his bachelor of science degree of 1920 was followed by that of doctor of philosophy in 1927. Joining the staff of the Department of Chemistry as an assistant 31 years ago, Dr. Huntress rose to the rank of professor of organic chemistry in 1941. He has been concerned with teaching and research at both undergraduate and graduate levels, serving seven years as head of the undergraduate division of organic chemistry and 11 years as chairman of the Graduate Committee of the Department of Chemistry. During the latter period, he was chemistry representative on the M.I.T. Committee on Graduate School Policy.

Dr. Huntress is a member of the M.I.T. Solar Energy Conversion Committee, a member of the board of the Technology Press, and this year completes his third term as chairman of the M.I.T. Faculty Committee on the Library. He is librarian and member of both the Council and Publication Boards of the American Academy of Arts and Sciences, to which he was elected in 1936. A member of the American Chemical Society since 1921, he is a former chairman of its northeastern section and was, for eight years, a member of its Richards Medal Committee. Dr. Huntress is an associate editor of the American Chemical Society's Chemical Monograph Series, a member of its Committee on Foreign Compendia and Committee on Nomenclature. In 1948 he was a member of the Scientific Information Conference held at London by the Royal Society, and served also as official representative of the American Documentation Institute to the International Federation of Documentation at The Hague.

His technical publications include nearly 100 scientific papers and patents, and he has contributed to *Proceedings of the American Academy of Arts and Sciences*. During World War II he served as technical adviser to the Chemical Warfare Service Development Laboratory at M.I.T. He is also the author of five books and has for some time been engaged in extensive biographical studies of distinguished men of science. Among his books are *Organic Chlorine Compounds* and *Problems in Organic Chemistry*. He is also coauthor, with the late Samuel P. Mulliken, '87, of *Identification of Pure Organic Compounds*.

Running for Office

ELEPHANTS and donkeys will play a part in elections this year as well as beavers. In ballots to be mailed toward the end of March, adherents of the Beaver party will elect new officers of the Alumni Association of M.I.T. into whose hands the administration of the Association will pass for one year beginning July 1, 1952. Alumni will also elect three of their number — each for a five-year term — to serve as members of the M.I.T. Corporation.

Edwin D. Ryer, '20, VI, Vice-president and Director of the Barbour Stockwell Company in Cambridge, has been nominated for the presidency of the Alumni Association, to succeed Alfred T. Glassett, '20, I.

The National Nominating Committee — composed of John L. Porter, '00, Donald B. Webster, '16, Winfield I. McNeill, '17, Walter R. C. Russert, '18, Harold E. Koch, '22, Harold C. Pearson, '23, Holland H. Houston, '24, George P. Edmonds, '26, George E. Colby, '32, and H. B. Richmond, '14, chairman — has

HIGH OFFICE



Fabian Bachrach

... in the Alumni Association of M.I.T. will go to Edwin D. Ryer, '20, VI, unopposed candidate for president of the Association for the year beginning July 1, 1952. Mr. Ryer is vice-president and director of the Barbour Stockwell Company, manufacturers of machinery in Cambridge. Mr. Ryer has represented his Class on the Alumni Council, has been chairman of the Advisory Council on Tech Show, was class agent and member of the Alumni Fund Board, and is a former member of the Executive Committee of the Alumni Association. He is a director of the Jordan Hospital in Plymouth, and a member of the Duxbury Yacht Club.



Fabian Bachrach



Blackstone Studios



Curtis Studios

NOMINATED FOR ALUMNI TERM MEMBERSHIP ON THE M.I.T. CORPORATION

for five years beginning July 1, 1952, are: Everett S. Coldwell, '15, VI, President, Chairman of the Board and Director of Ford, Bacon and Davis, Inc. of New York; Alfred T. Glassett, '20, I, President of W. J. Barney Corporation of New York; and William L. Stewart, Jr., '23, XV, Executive Vice-president of the Union Oil Company of California.

nominated Dwight C. Arnold, '27, XV, as vice-president of the Association to serve for two years. Mr. Arnold is president and treasurer of Arnold-Copeland Company, Inc. of Boston. Theodore T. Miller, '22, XV — Vice-president of Dewey and Almy Chemical Corporation of Cambridge — and Stanley C. Dunning, '17, XV — manufacturers' representative in Cambridge — have been named for posts on the Executive Committee for two-year terms.

Named for alumni term membership on the M.I.T. Corporation, to serve five-year terms each, are: Everett S. Coldwell, '15, VI, President, Chairman of the Board, and Director of Ford, Bacon and Davis, Inc., a New York engineering firm; Alfred T. Glassett, '20, I, President of the W. J. Barney Corporation, in New York, and President of the Alumni Association for the year 1951-1952; and William L. Stewart, Jr., '23, XV, Executive Vice-president of the Union Oil Company of California, and formerly chairman of Southern California M.I.T. Development Committee.

New representatives on the National Nominating Committee (one to be elected from each district) are: *District 1* — Boston — Raymond H. Blanchard, '17, X; *District 2* — Worcester — Ernest P. Whitehead, '20, I; Lawrence, Mass. — Dean K. Webster, Jr., '19, X; New Bedford — A. Russell Pierce, Jr., '31, XV; *District 4* — Rochester — Leon L. McGrady, '17, XV; Schenectady — Florence Fogler Buckland, '20, XIV; Syracuse — D. Earle MacLeod, '38, IX-B; Buffalo — Whitworth Ferguson, '22, VI; *District 5* — Newark — Walter L. Wise, Jr., '34, XV; New York City — Saxton W. Fletcher, '18, II.

This year the classes whose numerals end in the figures three and eight elect their class representatives for five-year terms, and nominations have been made by officers of their respective classes, beginning with the Class of 1893 and ending with the Class of 1948.

C. Adrian Sawyer, Jr.: 1881-1952

C. ADRIAN SAWYER, JR., '02, President of the Alumni Association for the year 1949-1950, died at his home in Waban, Mass., on January 29 at the age of 70. He was active in civic and engineering construction affairs in Metropolitan Boston.

While attending Technology, Mr. Sawyer took an active part in student affairs. He was treasurer of the Technology Athletic Club and member of the Tennis Association. He served on the staff of *The Tech* and was editor in chief of *Technique* for 1902.

After graduation, Mr. Sawyer was an assistant in the Institute's Department of Mining Engineering for a year, and from 1903 to 1907 was employed by the Andrew D. Fuller Company. From 1908 to 1918 he was with the George A. Fuller Company and from 1918 to 1924 with the Howes Brothers Company. In 1924 he founded the Sawyer Construction Company of which he was president until his death. In his professional capacity, Mr. Sawyer has been responsible for the construction of many large medical and educational units, including the Sloan Automotive Laboratory and Building 24 at the Institute.

Mr. Sawyer has served as chairman of the Newton Board of Appeal, as president of the New England Peabody Home for Crippled Children, as director of the Suffolk First Federal and Loan Association, and as president of the Brae Burn Country Club. He was trustee of the Hahnemann and New England Deaconess Hospitals, and commodore of the Boston Yacht Club.

As a loyal Technology Alumnus, Mr. Sawyer was a member of the Alumni Advisory Council on Athletics in 1918-1919; a member of the Alumni Council from 1932 to 1944; a member of the Executive Committee of the Alumni Association from 1932 to 1934; and president of the Alumni Association for 1949-1950.

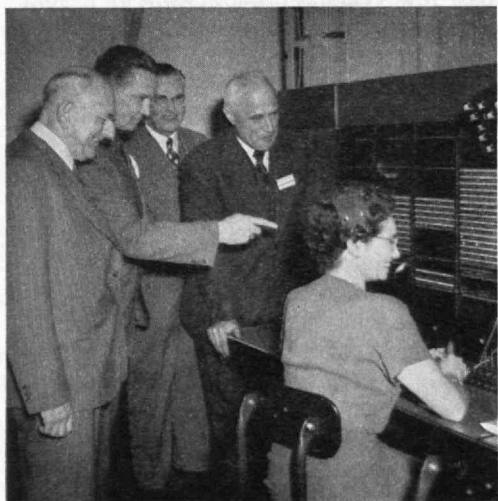
M.I.T. Expands Telephone Service

A NEW manual switchboard, the first of its kind in New England, was formally opened at the Institute on January 26, with a coast-to-coast telephone call from Joe E. Harrell, President of the New England Telephone and Telegraph Company, to James R. Killian, Jr., '26, President of Technology. Dr. Killian was in Los Angeles attending a conference of the M.I.T. Club of Southern California, where 200 Alumni attended a symposium on "Advances in Science."

The new switchboard with its additional dial lines — inaugurated before more than 250 representatives of the Bell system and M.I.T. in Huntington Hall — is one of the largest of its kind in New England.

In the long-distance telephone conversation, both sides of which were audible to guests in Huntington Hall, Mr. Harrell recalled that telephone progress "can be traced back to the technical skill demonstrated in the research that has been carried on by so many young Americans from schools like M.I.T." In reply, President Killian observed that this year also marks the 40th anniversary of the presentation to M.I.T. by the American Telephone and Telegraph Company, of the Deering Collection of about 30,000 volumes on electrical engineering. Long known as the Vail Library in honor of Theodore N. Vail, first president of American Telephone and Telegraph Company, this collection has now grown to 50,000 volumes. The Vail Library, President Killian stated, has had a profound effect on education in electrical engineering and is one of the outstanding libraries in electrical engineering in the world.

President Killian also recalled that there are about 375 Technology Alumni engaged in the Bell System, many of whom have held outstanding positions with Bell and its operating companies. This statement was well borne out by those who attended the inaugural ceremonies. Present from the New England Telephone and Telegraph Company were: Joe E. Harrell, President; Erskine N. White, Thomas M. Hennessey, Vice-presidents; James W. Thompson, Chief Engineer; James G. Moir, '20, Plant Extension Engineer; Winthrop F. Potter, '22, Transmission and Protection Engineer; Harris B. McIntyre, '22, General Rate Engineer; Parke D. Appel, '22, General Personnel Assistant; Eugene R. McLaughlin, '19, Division Commercial Supervisor; Thomas H. Barnard, '24, District Plant Engineer; Thomas F. Williams, '22, Metropolitan Traffic Engineer; Kennedy Pope, '20, Massachusetts Transmission Engineer; and Fearing Pratt, '22, Commercial Engineer. Other representatives of the Bell System included George W. Gilman, '23, Director of Systems Engineering for the Bell Telephone Laboratories, and Lawrence B. Grew, '27, and Frank P. Nettleton, '30, of the Southern New England Telephone Company. Among Technology personnel present were: Karl T. Compton, Chairman of the Corporation; Joseph J. Snyder, 2-44, Vice-president and Treasurer; Professor George R. Harrison, Dean of Science; Delbert L. Rhind, Bursar; Professor Carlton E. Tucker, '18, Executive Officer of the Department of Electrical Engineering; Professor Harold L. Hazen, '24, Head of the Department of Electrical Engineering; Mrs. Ruth McG. Lane, Vail Librarian; and Miss Agnes N. Morrice, Chief Operator.



M.I.T. Photos

Above: Professor Carlton E. Tucker, '18, Executive Officer of the Department of Electrical Engineering; Joe E. Harrell, President of New England Telephone and Telegraph Company; Delbert L. Rhind, M. I. T. Bursar; and Karl T. Compton, Chairman of the M.I.T. Corporation, inspect the new switchboard manned by Miss Agnes N. Morrice, Chief Operator.



Below: Gathered under the portrait of Theodore N. Vail, former president of American Telephone and Telegraph Company, for whom the Institute's library of electrical engineering is named, Professor Harold L. Hazen, '24, Head of the Department of Electrical Engineering (center), recalls the important role which the Vail Library has played in training communications engineers. Others in the group, in usual reading order, are: Dr. Compton, Mr. Harrell, and Erskine N. White and Thomas M. Hennessey, Vice-presidents of New England Telephone and Telegraph Company.



Webster Professorship Established

A GRANT of \$400,000 to the Institute from the Edwin Sibley Webster Foundation, to establish an Edwin Sibley Webster Professorship of Electrical Engineering, was announced on January 31 by Karl T. Compton, chairman of the Corporation of the Institute, at the midwinter meeting of Alumni in Metropolitan Boston.

In announcing the new professorship, which becomes the first endowed chair in the Department of Electrical Engineering at M.I.T., Dr. Compton said:

This endowed professorship is a particularly appropriate memorial to Mr. Webster, for he was one of the earliest students in M.I.T.'s Electrical Engineering Course. He also formed with his classmate, Mr. Charles A. Stone, the first electrical engineering consulting firm, which later became the national organization of Stone and Webster, Inc.

In reviewing Mr. Webster's long and active participation on the Institute's Corporation and its Executive Committee, Dr. Compton pointed out that Mr. Webster exhibited a special interest not only in the Department of Electrical Engineering but in seeing that the Institute moved toward an adequate endowment for its educational program. Dr. Compton also recalled that it was due in large part to Mr. Webster's enthusiasm over aeronautical engineering in its infancy that M.I.T. took its first steps in establishing the first Course in Aeronautical Engineering in the United States. Mr. Webster was president of the Alumni Association in 1909, a member of the Alumni Council, and president of the Class of 1888. The Stone and Webster firm constructed the central group of Institute buildings in Cambridge, and Messrs. Stone and Webster presented to the Institute the President's House.

Commenting on the significance of M.I.T.'s first endowed professorship in electrical engineering, Dr. Compton emphasized that such professorships are a means of fulfilling the primary object of the Institute's long-range Development Program, of giving special distinction to the men who are appointed to them, and of honoring and keeping alive the memory of great men of the Institute.

Two Receive Rhodes Scholarships

RHODES scholarships have recently been awarded to two candidates from M.I.T. — Arthur A. Waserman, '51, elected in New York, and Carl A. Shiffman, '52, elected in Massachusetts. These recent selections bring to 11 the total number of Rhodes scholars from the Institute, seven of whom have been chosen since the end of World War II, according to Walter H. Stockmayer, '35, Associate Professor of Physical Chemistry and M.I.T. representative for the Rhodes scholarships. From the whole United States 32 scholars are chosen annually.

The complete list of Rhodes scholars to be chosen from M.I.T. is as follows: Morris F. Shaffer, '30, Ivan A. Getting, '33, Walter H. Stockmayer, '35, Vernon G. Lippitt, '38, J. Ross Macdonald, 2-44, Gordon Raisbeck, '49, Eugene B. Skolnikoff, '49, William D. Barcus, Jr., '50, and Herbert D. Benington, '50. In

addition, at least three who received Rhodes scholarships were graduate students at the Institute at the time of their selection: Marshall Ballard, Jr., '35, Harry A. Watson, '48, and S. Alton Newton, Jr., '51.

The Institute has good reason to be proud of its record in recent years. In the opinion of Dr. Stockmayer, the enhanced attention which the Institute has given to the humanities has been an important factor in developing the type of man that satisfies the broad requirements of the Rhodes scholarships.

Counciliation

THE first meeting of the Alumni Council for the year 1952 — and the 286th meeting since the formation of the Alumni Association — was held in the Campus Room of the Graduate House on Monday, January 21, with Alfred T. Glassett, '20, President of the Association, presiding.

As first order of business, Donald P. Severance, '38, Alumni Secretary, reported that the Executive Committee had voted to "Authorize the Treasurer to withdraw the sum of \$5,000 from the Alumni Association Reserve Fund to meet part of the Institute's capital expense for transferring the alumni mailing lists to an IBM system, an expense now estimated at \$8,600." Changes in class affiliations for three Alumni were reported, as was also the fact that between November 26 and January 18, an even dozen members of the Institute's Faculty or staff visited a dozen M.I.T. clubs in a North American loop bounded by Montreal, Portland, Ore., San Francisco, Phoenix, and Atlanta. For the current year, visits through January exceed the total reported at the annual meetings in May of the past few years.

Nominations for officers of the Alumni Association for the coming year, as well as for members to serve on the National Nominating Committee, were reported. Because of its importance to Technology Alumni who will be asked to vote this spring, this topic is covered in a separate story in this section of The Review on page 249.

It was reported that the Executive Committee endorsed the following proposals of George W. McCreery, '19, cochairman of Alumni Day, 1952, as chairmen of Alumni Day subcommittees: *Banquet*: William H. Carlisle, Jr., '28; *Departmental Reunions*: Julius A. Stratton, '23; *Ladies' Events*: Mrs. John B. Wilbur; *Luncheon*: Theodore T. Miller, '22; *Registration*: Wolcott A. Hokanson, Staff; *Transportation*: Emmons J. Whitcomb, '11; *Stein Design*: Henry B. Kane, '24.

As director of the Alumni Fund, Mr. Kane reported that 5,369 Alumni to date have contributed a total of \$119,000 to the 1952 Alumni Fund, which is now starting its fourth month. Although this year's change of timing does not permit a real comparison with the figures of the 1949-1950 Fund, these results nonetheless, represent 400 fewer contributors but also show that the amount contributed is \$21,000 in excess of the 1949-1950 Fund for the same number of days after the start of solicitation.

Members of the Council were acquainted with recent developments at the Institute by Karl T.

(Concluded on page 254)

BUSINESS IN MOTION

To our Colleagues in American Business...

Revere began to make aluminum extruded shapes in 1922, and hence has had thirty years of experience with the metal. During those years it has gained invaluable experience, and has installed new equipment in order to expand the list of aluminum mill products it offers to industry. This expansion has been conducted at an accelerated pace during the past ten years. Today it may come as a surprise to some people that Revere's present installed capacity makes it the largest independent fabricator of aluminum in the United States.

Revere is sometimes asked why we should have sought the same position in aluminum alloys that we occupy in copper and copper-base alloys. The fundamental reason is a simple one: we wished to increase our service to industry, which is demanding more and more metals of every kind. Thirty years ago we recognized the growing importance of aluminum, and we also perceived that aluminum and copper are in many ways complementary metals. Being able to offer both means that Revere can be impartial in recommending the one most certain to give the best results in a given application.

So successful has been our experience with aluminum that we are now pursuing a comprehensive program of expansion in regard to it. In one of the Revere plants in Baltimore, new aluminum rolling mills and annealing furnaces were installed before

Korea, making possible tripled production of coiled sheet. Right now, in another Revere Baltimore plant, new extrusion presses and draw benches are being put in place. Equipment for the production of aluminum coiled sheet was installed in our Detroit plant over a year and a half ago. In about a year, the Los Angeles mill, now working with copper and copper-base alloys only, should begin to produce aluminum tube and extruded shapes in both the heat-treated and non-heat-treated alloys.

These plans to increase materially the Revere output of aluminum mill products will make them more quickly and easily available in various industrial centers. Here is evidence of our belief that the future of aluminum is as great as that of copper. Each has its place, in peace as well as war.

Revere's thirty-year growth in aluminum is in the American tradition of freedom to seek new ways to serve customers. It is typical of the business world, for in many thousands of companies the original products or lines have been expanded to include more or less related items. So we suggest that no matter what you buy, you ask your suppliers if they have other materials or products that would be of value to you. The more you know about what your suppliers make, the greater the possibility of improving your products or productivity.



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THE INSTITUTE GAZETTE

(Concluded from page 252)

Compton, chairman of the M.I.T. Corporation, who announced the recent promotions of: Professor Harold L. Hazen, '24, who has been in charge of the Department of Electrical Engineering, to succeed John W. M. Bunker as Dean of the Graduate School; Frederick G. Fassett, Jr., newly appointed Associate Dean of Students; and Professor Ernest H. Huntress, '20, as Director of the Summer Session.

President Glassett then called on Mr. Fassett to discuss the operations of the Technology Press and of the Office of Publications — both of which are still under his jurisdiction. He spoke briefly of the genesis of the Technology Press and its more recent 15 years of co-operative publishing with John Wiley and Sons, Inc. of New York.

Mr. Fassett spoke of the need which had brought about the establishment in 1951 of the Office of Publications, an office for the purpose of supervising and expediting the printing of M.I.T. official matter.

Next, Professor Hazen, last summer's chairman of the 15-man Engineering Education Commission to Japan, introduced the final speaker of the evening — Rogers B. Finch, '41, Assistant Professor of Textile Technology.

Professor Finch, who had been the junior member on this Commission organized at the request of the Japanese Ministry of Education, opened his talk by telling of the hospitality of the M.I.T. Association of Japan. In particular he mentioned travel accommodations for his group; the industries they observed; and the Japanese recreations and customs which had come most forcefully to their attention.

Alumni Discuss Weather, Medicine, and Feedback

THE annual midwinter meeting of Alumni of M.I.T. was held in Walker Memorial on January 31. Alfred T. Glassett, '20, President of the Alumni Association, presided at the meeting which was attended by approximately 1,000 Alumni, many of whom brought their sons. As keynote speaker, Karl T. Compton, chairman of the Corporation, reported to the Alumni on recent developments at the Institute, and announced a grant of \$400,000 for the establishment of the Edwin Sibley Webster Professorship of Electrical Engineering.

Professor George R. Harrison, Dean of Science at M.I.T., was master of ceremonies for three lectures given by members of the Institute's Faculty: James M. Austin, '41, Associate Professor of Meteorology, described modern methods of weather forecasting; Professor Francis O. Schmitt, Head of the Department of Biology, discussed medical research at the Institute, with emphasis on the significance of the electron microscope in this research; and Professor Gordon S. Brown, '31, Associate Head of the Department of Electrical Engineering and chairman of the Faculty, spoke on the growing importance of servo-mechanisms in industrial progress.

WHITHER CIVIL ENGINEERING?

(Continued from page 239)

D.W.T. What do you mean? You've got the old-fashioned point of view on foundation engineering — taking the soil as you find it and limiting the structure to fit. They don't do that any more.

T.W.L. I should say not. If the soil isn't the kind they want, they treat it chemically, and change its properties — increase its bearing capacity, its impermeability, or anything else.

H.P.A. Take that earth dam, for example: the cutoff wall is a thin membrane of impervious chemically treated clay, and the side slopes are steep because the shearing strength and the angle of repose of earth have been increased.

T.W.L. That building is settling up instead of down! Must have given the foundation an overdose!

W.M.F. They seem to have gotten away from the more conventional building shapes. The structural engineers must be building their structures around the activities that are actually going on in the building. They're more functional, and certainly are more clean-cut and streamlined.

E.M. You'd think that with all those curves, their unit building costs would be up.

M.J.H. Standard shapes, prefabrication, and mechanization of construction — that's the answer. That new concrete hospital is an all "prefab" job. And look at the erection of that row of six-story apartment houses; it's all being done from one gigantic overhead gantry crane that moves from block to block.

J.M.B. That new TV tower must be 2,000 feet high!

W.M.F. And that trestle for the rocket ships!

A.T.G. And that inverse membrane dam!

C.H.N. And that weird-looking building for the atomic-energy plant!

A.T.I. And that floating service island for the transatlantic hydrofoil ships!

A.J.B. And that vehicular tunnel under the English Channel!

J.B.B. All I can say is that I'm glad somebody else will be placement adviser by then!

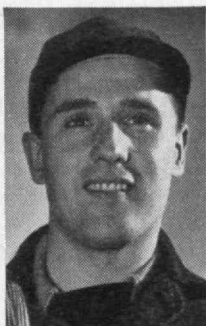
It will be seen that structural engineering had kept apace of the demands of construction, both within and beyond the scope of the civil engineering field. Better methods of analysis and design, ingenious new structural layouts, better use of existing materials, and the almost complete mechanization of prefabrication and erection had all played their part in reducing construction costs, and this, of course, was of utmost importance, since it meant that more structures could be built with the money that was available. But perhaps the most spectacular advances had come about as a result of the introduction of new and usually synthesized construction materials, once again demonstrating the vital role of basic research in civil engineering progress.

(Continued on page 256)



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companies are quick to send their people to help.

This ability to meet emergencies and restore service, so essential in peace, is even more important today. Bell Telephone Companies throughout the country have special plans to protect and maintain service if some sudden defense situation should arise.

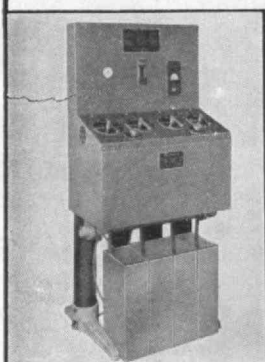
Whatever the need, it is reassuring to know that a well-trained army of Bell telephone workers — 650,000 strong — is equipped and ready to act quickly and effectively.

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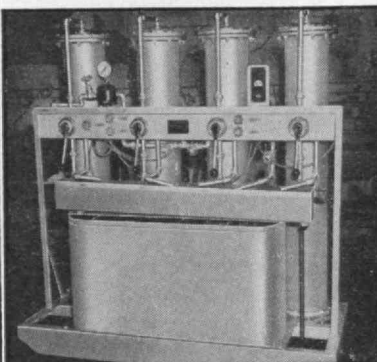


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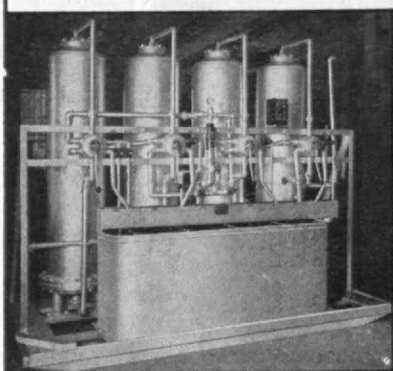
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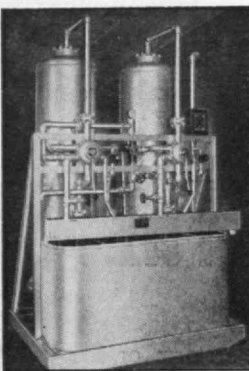
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WHITHER CIVIL ENGINEERING?

(Continued from page 254)

The relatively small number of bombproof buildings in existence was especially noteworthy, for it appeared that atomic warfare was no longer a major consideration. While other factors had been of utmost importance in bringing about this happy condition, the contribution of the civil engineer was not to be minimized. Hydraulic engineers had done much to increase the power and food supply of the world; sanitary engineers had played an important part in improving the environment in which people lived; transportation engineers had helped to distribute the goods of the world; while structural and foundation engineers, as the servants of the other three, had done their share by building the structures that made these things possible. All of these activities had contributed directly to a higher standard of living throughout the world, and thus had helped to remove one of the major causes of war.

And now I want to speak to you with complete seriousness. This is not to say that there has been no serious thought behind my previous remarks, for I have tried to give you a picture not only of what civil engineers do today, but of what the trends are likely to be in the future. Though my method of presentation has doubtless led me into pitfalls, I have tried to keep the over-all impressions that I hope

(Continued on page 258)



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AMP terminal connections (which had been subjected to salt spray) were placed in series with the input of a high gain, wide band pass amplifier (originally developed for checking thermal noise in R.F. input circuits). Dr. Wiesner's results, after testing AMP terminals, substantiate "the unlikelihood that metal-to-metal contact as it exists in crimped solderless connections would be expected to develop noise"

TEST #2 AT AN ARMED FORCES TEST LAB

Since a terminal has but a few milliohms resistance, this test required a special transformer to match this low impedance to the input of the amplifier, sensitive to levels of 0.2 micro volt. 60 AMP solderless terminals crimped to short lengths of wire in series, a similar number of carefully soldered joints, and a single piece of solid wire of equivalent R, were compared.

No noise difference was detectable between any of the three.

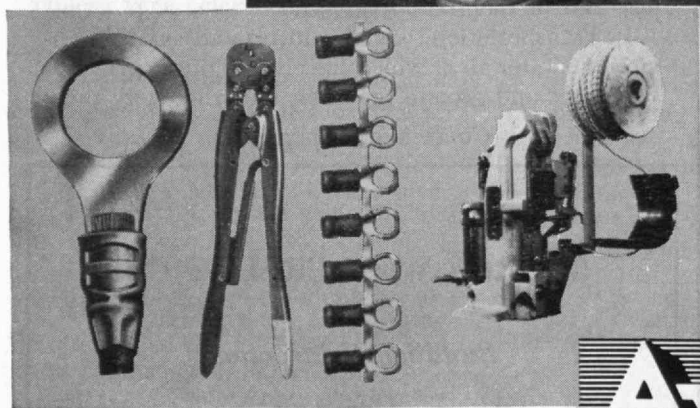
TEST #3 AT A PROMINENT UNIVERSITY LAB

7,000 AMP solderless connectors were crimped to short lengths of wire in series making a chain of terminals 340 feet long (see illustration). After aging for two years in an unfavorable atmosphere these 14,000 connections in series were tested at radio frequencies up to 20 megacycles.

AGAIN—Noise measurements were down to thermal magnitude.

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WHITHER CIVIL ENGINEERING?

(Continued from page 256)

to leave with you in line with an attempt to appraise the future of civil engineering in a serious manner. I hope that the net result has been of interest to all of you and particularly to the first year civil-engineering students who are here tonight.

If, among the latter, there are some who are still uncertain as to their final course selection, I would like to say to them: In choosing your course the most important question to ask yourself, in my opinion, is: Would I like that kind of work? Would I find it interesting? Because if you like doing something, you will do it successfully, and even more important, you will be happy doing it. Conversely, if you get into a field that you don't enjoy, you can't do a really good job, regardless of how hard you try. Of course there are other considerations, for what will happen to you in the profession you choose, depends on many things. If I may quote from Ecclesiastes IX:11: ". . . the race is not always to the swift, nor the battle to the strong, neither yet bread to the wise, nor yet riches to men of understanding, nor yet favour to men of skill; but time and chance happeneth to them all." You cannot tell what will have happened by 25, or 10, or even one year from now, but you do have some basis for knowing what kind of work you will find interesting, and to some degree, even exciting. If the work you are in can make you wake up in the morning, eager to meet the challenge of the new day; your future, though affected by time and chance, has every prospect of being a source of continuing satisfaction.



And to all of you, I would like to say: When you analyze what I've said tonight about the future of civil engineering — when you consider the different areas of civil engineering that I've discussed — there are certain ideas, certain common denominators, that come up again and again. These are so important that I shall conclude my remarks by pointing out just four of them:

1. Transportation, water control, and suitable environment, for all of which the civil engineer provides structures and ground facilities, underlie every thea-

(Continued on page 260)

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What GENERAL ELECTRIC People Are Saying

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Research Laboratory

PLANNING UNPLANNED RESEARCH: You can't plan to make discoveries. But you can plan work that will probably lead to discoveries.

Dr. Willis Whitney discovered a word which is in the dictionary—serendipity—and I don't like the definition that is given. Let me suggest this one: "The art of profiting from unexpected occurrences." Now, it seems to me a large part of the Laboratory work is based on that. You don't know all the things that are going to happen; too many of them are unexpected. But it is these unexpected things that are going to be the most profitable—the most useful—things you do.

In 1942, when I was President of the American Association for the Advancement of Science, I broadcast a half-hour talk in which I said that physics nowadays is not like the physics of the past century. There is classical physics, and there is quantum mechanics. What's the main difference?

The old idea of physics was that everything was perfectly, definitely due to causality. There was a definite relation of cause and effect. And that worked perfectly well in classical physics. But, then, years later came the quantum theory and the uncertainty principle of Heisenberg. But Bohr, five or ten years before Heisenberg's uncertainty principle, had the idea of the correspondence and uncertainty principles very clearly in mind. I remember Bohr saying that if a thirteen inch shell is coming toward you, several thousand feet a second—headed right toward you—it may pass through you and produce no effect whatever. There is a certain definite chance that this will happen—very small.

Take another example. You can see the track of an alpha particle. It's one quantum effect—a radium atom exploded. Fundamentally, you can't find the cause for such things. In fact, as Bohr pointed out very clearly, if you could find out what

it is that sets off a radium atom after 2000 years, then the whole of quantum mechanics would have to go by the board. It's basic that those must be the fundamental things, the probability, and not the cause of the definite action. All right, if an alpha particle can leave a track and a man can do something as a result of it—see it, for example—he may either get killed or not get killed because of timing. He may be run over by an automobile because he left his office a little later than he otherwise would have.

So single quantum effects can affect the lives of individuals. Now, the moment you prove that in principle, the whole basic idea of cause and effect is gone for all those phenomena that can be started from small beginnings and grow up to large things.

Take heredity, for instance. A single gene cell can be affected by a cosmic ray or by x-rays. Single quantum phenomena. They're absolutely interminable. And, therefore, basically the whole development of the human race has not been the result of cause and effect—only probabilities.

Come down to human affairs—an idea, for instance. How did it begin? Why, with something as small as a quantum, or the actions of a lot of separate quanta, of course. You have the dividing of the ways. Either you do one thing or the other. You continue to have alternatives. Those alternatives may determine things of tremendous importance.

If you can't predict ideas, you can't plan things in a laboratory. But you can organize a laboratory so as to increase the probabilities that useful things will happen there. And, in so doing, keep the flexibility, keep the freedom. That's what freedom is for. All of us in this Research Laboratory are interested in freedom. We know from our own

experience that in true freedom we can do things that could never be done through planning. That's why we are going to beat out Russia in the long run.

Stalin believes that everything can be planned. Marx believed that everything could be planned. That's the trouble with all dictators. They think that they can run the world by planning from above. And that is an utter impossibility, basically and fundamentally, because of the existence of divergent phenomena.

The moment that you see that the world isn't a kind of place where complete planning is possible, then you believe in democracy, you believe in freedom and initiative—in all the kinds of things that can be planned only in very general ways, not in detail.

What did Mussolini try to do? What did Hitler try to do? They had plans for conquering the world, and they knew just how to do it. They failed. They failed for many reasons, but one of the reasons is that you can't run things that way. And I think, no matter how far you may go in dictatorship, no matter how far it may succeed, it will ultimately fail because of the impossibility of planning on a world-wide scale.

Now, in this Laboratory we have a good example. I think most of us here have ideas of freedom and of the importance of thinking things out in our own way. Human virtues such as curiosity, initiative, interest in things, and just doing things for the fun of it, add up to me as just one of the things you realize in this Laboratory. And if only it could be that way on a world-wide scale, we would be much better off than we are now.

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WHITHER CIVIL ENGINEERING?

(Continued from page 258)

ter of human activity. Essential as they are today, they will be needed even more vitally as civilization becomes more complex.

2. The birth of each new branch of engineering creates new opportunities for the civil engineer: for example, aeronautical engineering has made the airport necessary; mechanical engineering has led to our traffic problems; chemical engineering has created many of our problems of stream pollution.

3. Each advance in another field of engineering or in science leads to new ideas and new tools that help to advance the field of civil engineering: for example, aerodynamics has stimulated hydraulics; colloidal chemistry is helping soil mechanics; the development of electronics has aided in instrumentation for civil-engineering research.

4. The keys to the future of civil engineering are threefold:

(first) A growing awareness of social and economic values, leading to sounder planning; (second) A growing emphasis on fundamental research, leading to better design, and (third) The wiser management of men and equipment, leading to better methods of construction. But of

these three keys, research is the most important, for it is only by extending the boundaries of knowledge that a profession not only maintains its stature, but forges its way to the new frontiers that always lie ahead.



REFERENCE KEY

Alphabetical list of names and titles of members of M.I.T. Department of Civil and Sanitary Engineering identified by initials in foregoing article.

H.P.A. — Harl P. Aldrich, Jr., Assistant Professor of Soil Mechanics.

J.B.B. — John B. Babcock, 3d, Professor of Railway Engineering.

J.M.B. — John M. Biggs, Assistant Professor of Structural Engineering.

A.J.B. — Alexander J. Bone, Associate Professor of Highway and Airport Engineering.

J.W.D. — James W. Daily, Associate Professor of Hydraulics.

R.E. — Rolf Eliassen, Professor of Sanitary Engineering.
(Concluded on page 262)

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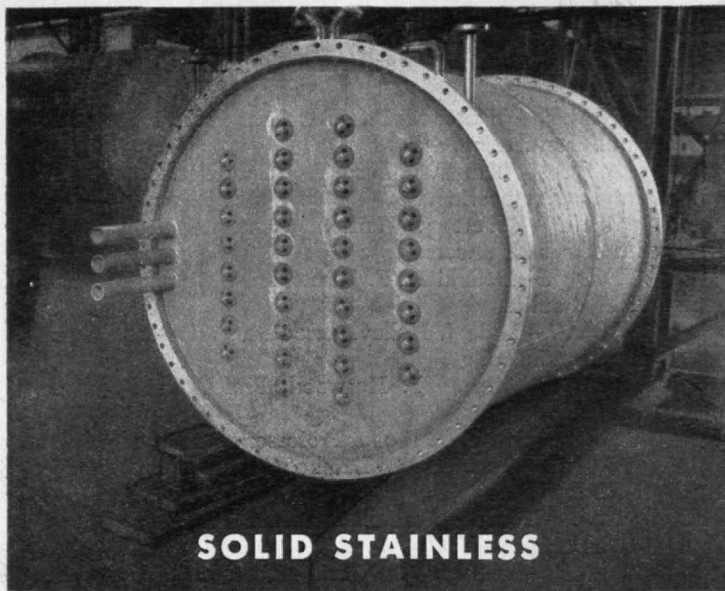
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W.M.F. — Walter M. Fife, Associate Professor of Structural Engineering.

A.T.G. — Allan T. Gifford, Associate Professor of Hydraulic Engineering.

R.J.H. — Robert J. Hansen, Associate Professor of Structural Engineering.

D.R.H. — Donald R. F. Harleman, Assistant Professor of Hydraulics.

M.J.H. — Myle J. Holley, Associate Professor of Structural Engineering.

M.P.H. — Murray P. Horwood, Professor of Sanitary Science.

A.T.I. — Arthur T. Ippen, Professor of Hydraulics.

T.W.L. — Thomas W. Lambe, Assistant Professor of Soil Mechanics.

E.M. — Eugene Mirabelli, Associate Professor of Structural Design.

C.H.N. — Charles H. Norris, Professor of Structural Engineering.

H.M.P. — Henry M. Paynter, Jr., Assistant Professor of Hydraulic Engineering.

C.N.S. — Clair N. Sawyer, Professor of Sanitary Chemistry.

H.J.S. — Herman J. Shea, Associate Professor of Surveying.

W.E.S. — William E. Stanley, Professor of Sanitary Engineering.

D.W.T. — Donald W. Taylor, Associate Professor of Soil Mechanics.

J.B.W. — John B. Wilbur, Professor of Civil Engineering; in charge of the Department.



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24	7	45	1.5	.050"	1.4	2.5	7.00	6	7	8.60	
24	19	45	1.5	.050"	1.4	2.5	8.00	6	7	9.60	
22	7	28	6.	.060"	2.2	3.5	7.50	7	9	9.20	
22	19	28	6.	.060"	2.2	3.5	8.00	7	9	9.70	
20	7	17	10.	.070"	3.5	5.0	8.00	10	12	9.80	
20	19	17	10.	.070"	3.5	5.0	8.50	10	12	10.30	
18	7	11	15.	.080"	5.6	7.5	8.50	14	17	10.50	
18	19	11	15.	.080"	5.6	7.5	9.00	14	17	11.00	
16	19	8.1	27.	.090"	8.8	11.0	10.00	17	20	12.10	
16	41	8.1	20.	.090"	8.8	11.0	11.00	17	20	13.00	
14	19	5.1	27.	.105"	13.7	16.	13.00	22	28	15.40	
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RENAISSANCE IN METAL CUTTING

(Continued from page 247)

Other more conventional testing techniques, such as microhardness determinations, true stress-strain tests for workpiece materials, and the preparation of photomicrographs to establish metallographic structure are of a considerable value in metal-cutting studies. Fig. 5 shows a special application of the standard photomicrographic technique that is very useful in studying the nature of the roughness of finely finished surfaces. In this case a ground surface is plated and then sectioned by a plane that makes a small angle with the original surface. When the sectioning plane is polished and etched and observed through the microscope, a picture such as that of Fig. 5 is obtained. This method provides a view of the surface that conveniently has different magnifications in the two directions. The individual grooves that were left by the grinding grits in producing this surface are seen to be about 50 micro-inches deep and about 750 microinches wide.

The x-ray diffraction camera is one of the less familiar, conventional test methods that has been recently used in metal-cutting studies. Pictures, such as those shown in Fig. 6 are produced by causing an x-ray beam to be refracted from a metal surface and then onto a photographic plate. When the specimen is in the annealed condition, the refraction pattern will consist of sharply defined circular arcs as shown in Fig. 6, but when the surface is cold

worked, as by grinding, the refraction pattern is diffuse. By progressively etching layers from a ground surface and taking x-ray pictures of the surface thus uncovered, the depth of the cold-worked layer that is produced by a machining operation may be determined.

As is evident in the foregoing brief discussion of some of the research methods that are now employed in fundamental metal-cutting studies, many techniques and concepts have been drawn upon from other fields of endeavor. However, metal-cutting research is also extending its influence into apparently unassociated areas. For example, the organic chemist is now utilizing the results of a fundamental study of cutting fluid action to synthesize chemicals more effectively. In one very important type of reaction, metallic magnesium is reacted chemically with halides to produce valuable and versatile intermediates known as Grignard reagents, after their inventor. Glass apparatus, such as that shown in Fig. 7, is the conventional means for carrying out such reactions. Obviously this is a batch-type, small-scale operation and it is quite hazardous, too, inasmuch as the reaction must be carried out in the presence of large quantities of inflammable ethyl ether. Apparatus similar to that shown in Fig. 8 is now used to cut magnesium in the presence of the liquid reactants. Due to the very high pressures and temperatures obtained at the cutting point and the continuous generation of nascent, oxide-free surface,

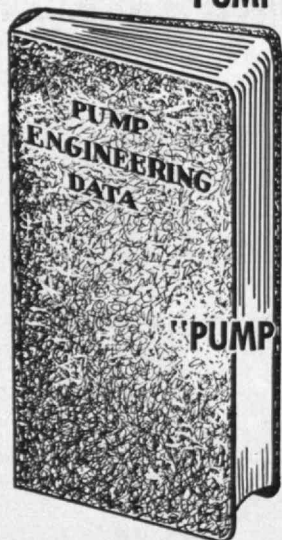
(Continued on page 266)

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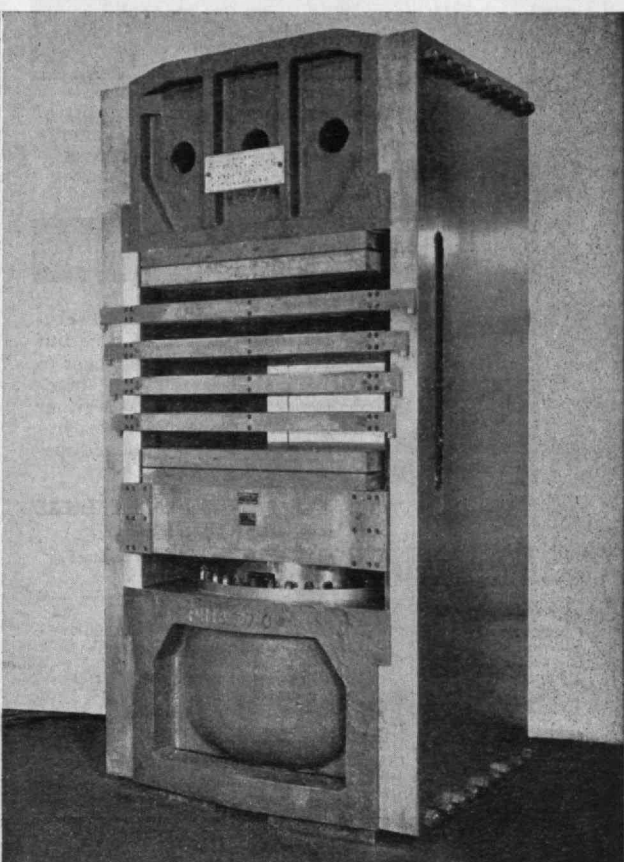
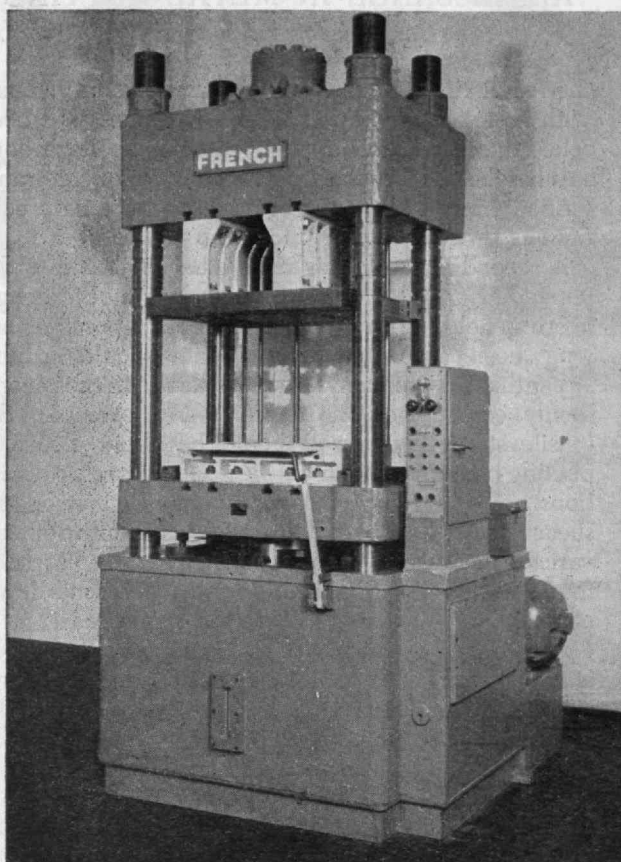
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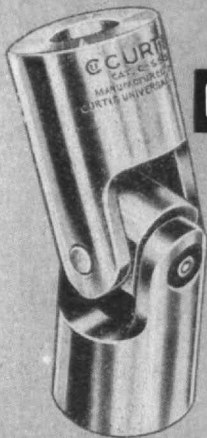
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RENAISSANCE IN METAL CUTTING

(Continued from page 264)

the reaction can be made to go forward continuously with no induction period. The new process has been called mechanical activation. The once hazardous and batch-type Grignard process has now been transformed from a laboratory curiosity into a safe continuous process with an industrial future.

A second example might be cited to illustrate the impact of metal-cutting research on another engineering field. From physicists' calculations it has long been suspected that metals should exhibit strengths that are many times greater than those commonly experienced in practice. For example, the tensile strength of steel should be about 4,000,000 pounds per square inch on the basis of such calculations. In metal cutting, a pronounced effect on the shear stress has been observed as depth of cut varies. The flow stress on the shear plane has been found to increase significantly with decreased depth of cut. However, this increase in stress ceases at a certain depth of cut of about 30 microinches, which is the depth of cut obtaining in a fine grinding operation. At this point the shear stress appears to be close to 2,000,000 pounds per square inch (which is in good agreement with the aforementioned theoretical tensile value of 4,000,000 pounds per square inch according to the maximum shear theory). The explanation for the huge difference between the strength of a very small specimen and one the size of ordinary structures is simply that all metals contain flaws, and the probability of a flaw being present in a given specimen decreases as the specimen size is reduced. Strangely enough, the long-sought-for critical experiment to demonstrate the existence of a theoretical strength for metals and a size effect has apparently been found unexpectedly in the grinding operation, where a materials test may be performed on a specimen that is phenomenally small (corresponding to a tensile test specimen of less than 30 microinches in diameter).

Getting Results to Industry

The gathering of experimental data and its interpretation is not the sole problem of an engineering research laboratory. The job is only half completed at this stage. The knowledge developed during the experimental phase must get into the hands of those

(Concluded on page 268)

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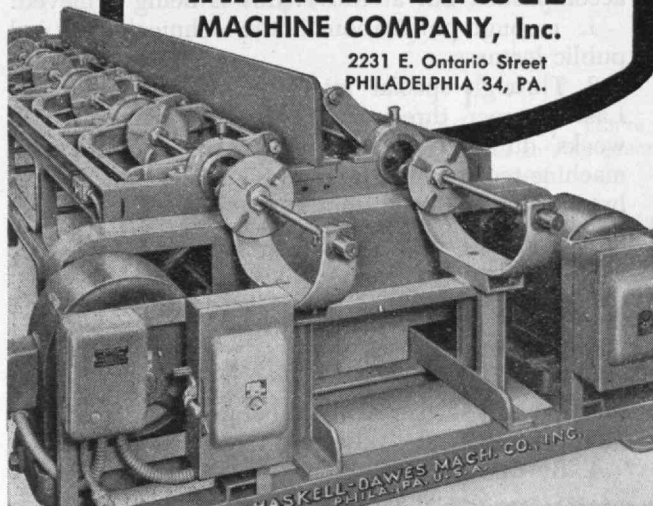
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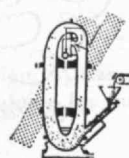
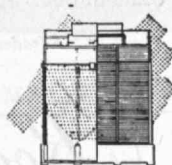
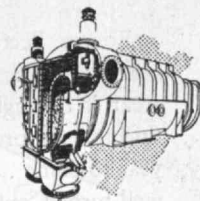
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RENAISSANCE IN METAL CUTTING

(Concluded from page 266)

who can put it to use before an engineering research investigation may be considered to be successfully completed. New material must quickly find its way into the teaching program and also be made available to industrial workers. The task of introducing new ideas and concepts into the teaching program is best accomplished by having those engaged in teaching simultaneously engaged in a vigorous research program. The problem of disseminating research findings to persons in industry is not easily accomplished but at M.I.T. this is being achieved:

1. Through publications in the technical press and public lectures;
2. Through special intensive summer programs. Last summer three such programs, each of two weeks' duration and designed to be of interest to machine-tool people, were presented at M.I.T., embracing the following topics: metal cutting, lubrication, and hydraulic controls;
3. By making available to industry well-trained graduate and undergraduate students who are thoroughly familiar with current developments in metal-cutting research. This is probably the most effective means of establishing the all important liaison between the academic laboratory and industry, but requires a relatively long time for fruition;
4. By direct consultation.

Conclusion

The fact that an art as old as metal cutting should have progressed so little in the direction of a science is most discouraging. However, some encouragement is to be found in the fact that it was less than 15 years ago that the first attempts were made, by Viano Piispanen, a Finnish engineer, to attack this problem from the standpoint of analytical mechanics. A great deal of progress has been made since that time. If the metal-cutting industry continues to support the fundamental studies now under way, and continues to express a patient and sympathetic attitude toward the efforts being extended, the renaissance in metal cutting may well be completed in a short time. It will then be possible to attack a metal-cutting problem on the same rational basis as is now commonplace in the fields of power-machinery design, hydraulics, and metallurgy.

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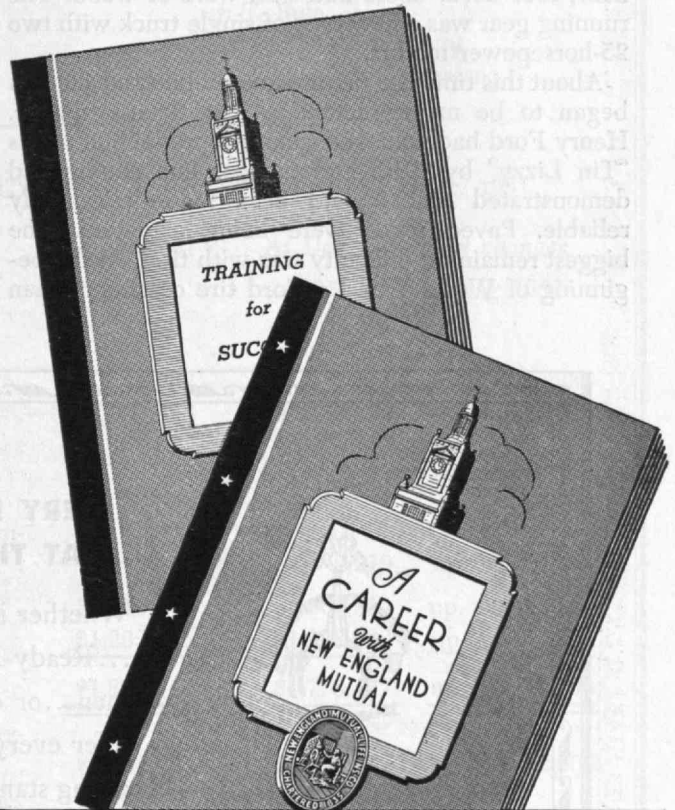
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STEBROTHER TO THE IRON HORSE

(Continued from page 244)

A car that could be used throughout the entire year, in place of the duplicate complement of open and closed cars, had been the subject of many experiments. The rising costs of the World War I period forced the adoption of such cars, known as "semi-convertibles," because of the large windows that could be opened wide for summer comfort. Increased costs were also largely responsible for a totally new design of car — the Birney safety car.

From the start the Birney safety car was designed to be operated safely by one man. It contained such safety devices as the dead-man control (which would bring the car to a safe stop if the motor controls were unattended) and the doors interlocked with the air brakes. The body had rather light steel subframe, window posts, roof arches, and side panels, but the floor, roof deck, doors and sash were of wood. The running gear was a new type of single truck with two 25-horsepower motors.

About this time the private automobile and the bus began to be major factors in local transportation. Henry Ford had achieved quantity production of his "Tin Lizzy" by 1910; and the gasoline engine had demonstrated that it had been made reasonably reliable. Paved roads were being extended. The biggest remaining difficulty was with tires. At the beginning of World War I a Ford tire cost more than

\$30 and could be used for possibly 4,000 miles. Punctures and blowouts were frequent so that every trip became an adventure, with arrival time highly uncertain. Trucks and busses ran on solid rubber tires which combined reliability with a barely acceptable minimum of cushioning.

During World War I, tire manufacturers happened to try carbon black as a substitute for unobtainable filler materials in their rubber mix. They were surprised to find that the result was an abrasion-resistant material which was ideal for tire treads, at least doubling the life and greatly reducing punctures and blowouts. Meanwhile, automobile production was multiplying and prices were dropping. From 1908 to 1910, Ford made perhaps 8,000 cars selling at more than \$900 apiece; a dozen years later he made more than 1,000,000 cars a year and the price was about half as much.

As a result the farmer bought a "flivver" to take him to town, instead of the slow horse and buggy or the infrequent trolley. The city dweller bought a home in the country and relied on his car to take him to work. The workman took a Sunday drive instead of a trolley ride. Wildcat operators started jitney-bus lines in direct competition with the trolley routes. The majority of trolley companies went into receivership and a substantial mileage of line was abandoned and dismantled. Among the abandonments was the Needham-Wellesley line mentioned in the 1914 trip. By 1916 this line was taking in \$0.18 per car-mile, but

(Continued on page 272)



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The data presented below summarize the Fund's transactions during 1951 together with cumulative figures for the past twenty years.

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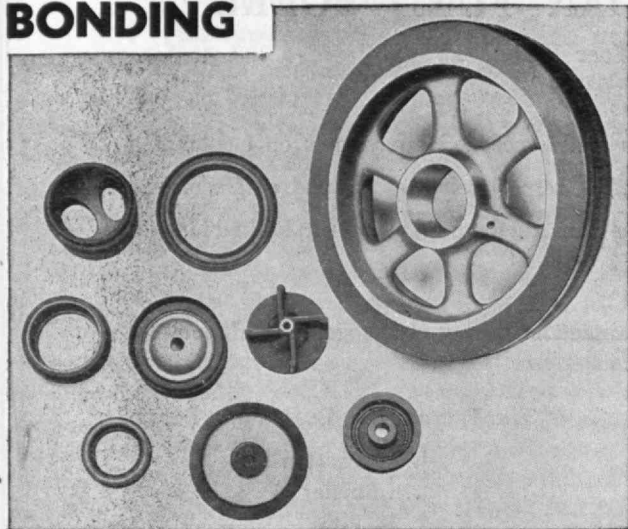
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CUMULATIVE RECORD OF THE TECHNOLOGY LOAN FUND TO DECEMBER 31, 1951

	At Dec. 31 1951	At Dec. 31 1950	Net changes during 1951
ITEMS OF OUTGO:			
Number of Men Receiving Loans	3,382	3,144	up 238
Total Amount Loaned	\$2,435,025	\$2,253,879	up \$181,146
Average Per Capita Loan	\$ 720	\$ 717	up \$ 3
ITEMS OF INCOME:			
Number of Men Whose Indebtedness has been Completely Discharged	2,357	2,279	up 78
Principal Repayments in Advance	\$ 618,078	\$ 601,914	up \$ 16,164
Other Principal Repayments	<u>\$1,232,765</u>	<u>\$1,176,223</u>	up \$ 56,542
Total Principal Repayments	<u>\$1,850,843</u>	<u>\$1,778,137</u>	up \$ 72,706
Total Principal Matured, Considering "Advance Repayments" as Matured, when Paid	\$1,882,891	\$1,810,287	up \$ 72,604
Collection Ratio, i.e. Percentage of Total Maturities Paid	98.3	98.2	up 0.1
Matured Principal in Arrears	\$ 22,679	\$ 23,390	down \$ 711
Actual "Written Off" Accounts	<u>\$ 9,370</u>	<u>\$ 8,760</u>	up \$ 610
Total Maturities Unpaid	\$ 32,049	\$ 32,150	down \$ 101
Percentage "Written Off" to Total Loans	0.38	0.38	
Percentage Matured Loans in Arrears plus Amount "Written Off" to Total Loans	1.32	1.43	down 0.11
Interest Received	\$ 236,891	\$ 231,855	up \$ 5,036
Times Interest Received to Matured Loans in Arrears plus Amount "Written Off"	7.4	7.2	up 0.2
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STEPBROTHER TO THE IRON HORSE

(Continued from page 270)

its operating costs came to \$0.27. A one-man Birney safety car was ordered for the line, but in 1918 there came a strike and resulting increase of operating costs, so the line was abandoned.

In the early 1920's, several truck manufacturers introduced "streetcar type" busses with seats, doors, fare registers, and body details very similar to current models of trolleys. They seated from 25 to 30 passengers, and they were equipped with pneumatic tires, and sometimes with air brakes. Street railway companies tried these new vehicles for route extensions, and as a substitute for cars on lines where the track was worn out and traffic was too light to justify replacing it. They proved highly successful and bus substitutions for trolley cars steadily multiplied.

But the trolley car put up a good fight. The Birney safety car proved to be too small for most lines, and its single truck made its riding qualities poor. Double truck cars, which kept the one-man operation and the lightweight steel construction of the Birney, were designed and built in large numbers in the 1920's. The Boston Elevated Railway, for example, adopted a design seating 48, weighing 15 tons, and powered with four 25-horsepower motors. This car would do substantially the same work as a 1911 design seating 52, weighing 26 tons, and powered with four 50-horsepower motors. Furthermore, the newer designs were more economical in power consumption and track wear than their prototype of a decade earlier. Where riding was heavy the large seating and standing capacity made such cars less expensive to operate than a bus. As for capital cost, a car cost about as much, per seat, as a bus. Offsetting the large capital investment in track, wire, and power plant was the much longer life of cars: track would last a good 20 years, and cars at least 30. Early busses were considered good for five years; today seven to 10 years is the usual estimate.

In the early 1930's, a group of transit executives, called the President's Conference Committee, initiated a project that led to the development of the streamline trolleys seen in many cities today. These cars were introduced commercially in 1936, and now some 2,000 are in service. Four 55-horsepower motors (about twice the power-to-weight ratio of previous cars) give extremely high acceleration, and the mo-

(Concluded on page 274)

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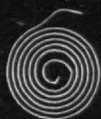
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(Concluded from page 272)

tors are also used for smooth dynamic braking. The resistance of the starting box for both acceleration and braking has a large number of steps to eliminate jerk. Hypoid-gear drives and rubber-bodied wheels greatly reduce noise. Streamline styling, cushioned seats, foot-operated controls, windshield wipers, stop lights, and sealed-beam headlights were adopted from current automotive design.

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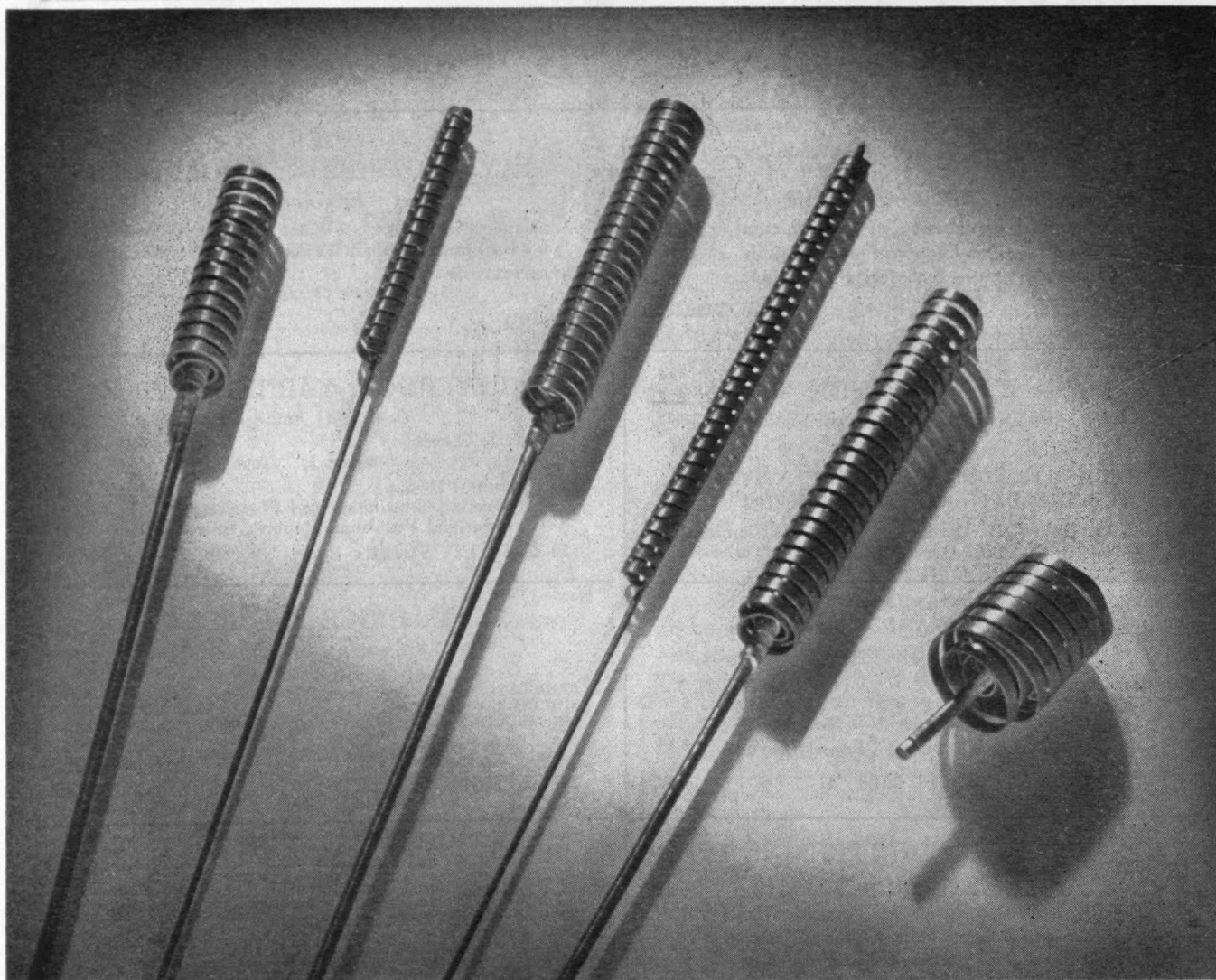
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Alumni AND Officers IN THE News

Above the Crowd

MYRON H. CLARK'03, JOHN W. NICKERSON'09, and JOSEPH N. SCANLON, staff, are included among 18 authorities appointed in January to advise the government's newly-created Mutual Security Agency, successor to the Economic Co-operation Administration. Mr. Nickerson has been named chairman of the advisory group, whose over-all purpose it is to help western European countries raise their productivity.

On the cover and as a featured personality of *Time* magazine (February 4, 1952) is CLARENCE D. HOWE'07, Canada's Minister of Trade and Commerce and Minister of Defense Production. *Time* calls him the man who "has contributed most to Canada's recent progress."

FREDERICK H. NORTON'18, Professor of the Physics of Metals at M.I.T., has received one of four national awards for outstanding contributions in the field of industrial heating, presented at the mid-winter meeting of the Industrial Furnace Manufacturers Association on January 21 in Pittsburgh, Pa. The award, known as the Trinks Industrial Heating Award, was bestowed upon Professor Norton particularly because of his outstanding contributions to the development of special refractories and because of his collection, analysis, organization, and publishing of information on refractories.

On January 15, the Society of Automotive Engineers announced the election of DANIEL P. BARNARD, 4th, '21, as president of the society for 1952. Dr. Barnard, is research co-ordinator of the Standard Oil Company of Indiana and has dedicated many years of study to the field of mutual adaptation of fuels and engines.

LAURENCE B. DAVIS'22 has been elected a vice-president, director, and member of the executive committee of the Socony-Vacuum Overseas Supply Company.

WILLIAM WEBSTER'23 and EDWARD L. BOWLES'24 are among 10 men in the nation who will serve the secretary of the Army and chief of staff as members of the Army's scientific advisory panel. [Messrs. Webster and Bowles are listed in addition to those men mentioned in the February issue of *The Review*.]

JOSEPH S. HARRIS'27, manager of the Shell Oil Company's Aviation Department, has been named chairman of the Aviation Advisory Committee of the American Petroleum Institute.

FRANK A. RECORD'33 has been appointed chairman of the Department of Electrical Engineering at Clarkson College of Technology in Potsdam, N.Y.

Thirteen members of the staff at M.I.T. have been appointed to technical subcommittees of the National Advisory Committee for Aeronautics for 1952. Such appointments imply recognition of

the leadership of the individual chosen, in his special field of competence. Technology men appointed include the following: JOHN R. MARKHAM'18, EDWARD S. TAYLOR'24, HENRY G. HOUGHTON, JR., '27, ASCHER H. SHAPIRO'38, ROBERT C. SEAMANS, JR., '42, GLENN C. WILLIAMS '42, NICHOLAS J. GRANT, 2-44, HOLT ASHLEY'48, RAYMOND L. BISPLINGHOFF, ARTHUR T. IPPEN, CHIA-CHIAO LIN, and RENE H. MILLER.

Written and Spoken

The Proceedings of the American Academy of Arts and Sciences (Volume 81, No. 2, pages 33-100, January, 1952) carries an article written by ERNEST H. HUNTRESS'20 entitled, "Biographical Digests IV: Centennials and Polycentennials during 1952 with Interest for Chemists and Physicists."

"Power—Horse or Unicorn?" was the title of a speech given by HENRY B. DU PONT'23, Vice-president of E. I. du Pont de Nemours and Company, before the annual meeting of the Baltimore Association of Commerce on January 24.

EDGAR B. GODLEY'26 gave an illustrated talk entitled, "Computing Mechanisms for Airborne Fire Control" before the Central Indiana section of the American Society of Mechanical Engineers on January 18.

"Dispersal and the Architect" was the title of a talk given by BURNHAM KELLY '41, Associate Professor of City Planning at M.I.T., to the Massachusetts chapter of the American Institute of Architects on January 16.

JEROME NAMIAS'41, with Walter G. Leight, has written an article entitled, "The Current Long-Range Forecasting Program of the U.S. Weather Bureau," published in the January, 1952, issue of *Scientific Monthly*.

KARL T. COMPTON, chairman of the M.I.T. Corporation, has written an article, "Science on the March," which was published in the January, 1952, issue of *Popular Mechanics* and condensed in the February, 1952, issue of *Science Digest*.

Mexican Skyscraper

In Mexico City, a 40-story skyscraper, which will be the tallest building in Latin America, is being constructed with the help of LEONARDO ZEEVAERT WIECHERS '40, structural engineering specialist. The Los Angeles, Calif., *Times* of December 9 has this to say about his work: "Because of studies made by Dr. Zeevaert [Wiechers] . . . Mexico City is no longer restricted to small buildings by its sinking subsoil and the danger of earthquakes. The capital now is well on its way to becoming one of the handsomest, if not the best looking, cities in all Latin America. . . . Dr. Zeevaert [Wiechers] devised a floating foundation and pile combination for the new Latino-Americana Building."

Obituary

- GRANVILLE S. ALLEN'88, July 13.
HOWARD B. EMERY'89, December 17.
CHARLES H. ALDEN'90, September 27.*
JOHN L. BATCHELDER'90, January 6.*
GEORGE L. NELSON'90, date unknown.
HORACE BURROUGH, JR., '92, December 26, 1948.
BARRON P. DUBOIS'92, January 3.*
ARTHUR G. FARWELL'93, January 20.*
FREDERIC W. LORD'93, December 31.*
JOHN N. FERGUSON'94, January 6.*
CHARLES C. FRENCH'94, April 28, 1950.*
CHARLES M. GAY'95, December 15.
MILAN P. HARLOW'95, January 29, 1951.
JAMES M. BROWN'97, January 14.
CHARLES S. BUELL'97, October 24.*
HENRY C. GREENE'97, December 29.
HENRY F. HOIT'97, summer, 1951.*
BENJAMIN A. HOWES'97, January 9.*
HENRY F. SCOTT'98, August 30.*
ALBERT B. BRIGGS'00, November 2.*
A. ROSECRANS BALDWIN'01, October 21, 1950.*
CHARLES B. COBURN'01, December 4.*
V. FRANK HOLMES'01, January 4.*
WALTER D. PRATT'01, December 14.*
GEORGE P. SHUTE'01, December 29.
EDWIN E. KIMBALL'02, December 26.
C. ADRIAN SAWYER, JR., '02, January 29.
GEORGE W. LANDRUS'04, September 7.*
HERMAN E. THOMPSON'04, December 17.*
HARRY S. FOLAND'05, June 9, 1950.
JOHN M. MCMILLIN'07, December 27.*
HORACE W. CALDER'08, August 28.
THOMAS B. BLACK'09, February 18, 1951.
H. USHER MILLER'09, November 3.
KENNETH LEAVENS'10, December 20.
JAMES R. CARPENTER'11, October 11.
EARLE M. GIESEY'12, November 23.
WYLIE J. DANIELS'13, October 3.*
ARTHUR S. PAGE'14, January 11.*
WILLIAM B. ROSS'17, November 19.
HOWARD S. THOMPSON, JR., '17, September 4, 1950.
GEORGE C. DAVIS'18, November 29.*
BERNARD O. PINKHAM'18, September 9.*
MRS. CHARLES D. SMITH'18, December 7.*
RUSSELL C. JOHNSON'21, December 3.*
JOHN S. MCWILLIAMS'22, February 3, 1951.*
EDITH T. SEARS'22, summer, 1951.
CHARLES E. STARBIRD'22, February 9, 1950.*
CORNELIUS D. SULLIVAN'22, December 19, 1950.*
CHARLES W. WHITTEMORE'22, November 19.*
DAVID B. BOND, JR., '24, date unknown.
LON S. GREGORY'24, December 16.*
HENRY E. PRADY'25, January 3.
BRANDT W. WILSON'25, May 29.
IRVIN L. MURRAY'26, January 9.
RAYMOND D. LEONARD'27, November 11.*
ALAN D. WHITTAKER, JR., '27, October 8.*
FRANCIS S. WALKER'30, January 20.
MARY H. FRYE'43, May, 1951.
JAMES B. LEGRAZIE'49, December, 1951.
*Mentioned in class notes.

News FROM THE Clubs AND Classes

CLUB NOTES

The M.I.T. Club of Cincinnati

The Club had a dinner on January 9 at the Hotel Alms to hear Ivan J. Geiger, Director of Athletics at the Institute, tell us about athletic and recreational activities there. Professor Geiger painted such an alluring picture of the sailing and other inducements, that some of us of the old "monkey drill" days may again apply for admission.

Those present were: Gerald Burns'51, S. S. Bushnell, Jr., 2-46, S. H. Champlin '13, Gordon L. Foote'38, Joseph S. Gottlieb'50, Frank J. Iskra'48, Myron G. Johnson, Jr., '42, E. H. Kruckemeyer'11, H. D. Loring'07, Fred. W. Morrill'07, James W. Pearce'37, J. S. Raffety'22, Nathan Ransohoff'10, Walter L. Rapp'00, Earl N. Reynolds'39, Philip H. Rhodes'35, Robert B. Schildknecht'30, F. W. Spalding '22, C. H. Spiehler'08, C. A. Stewart'12, Charles H. Urban'91, Kenneth A. Wright '19, and the Secretary.

Disaster was averted by presence of mind of President Jim Pearce. Bob Schildknecht was dispatched to the bar to announce dinner to a group of lingerers, but failed to return with them while the soup grew cold. Jim rose to the occasion, however, and selected the Secretary as a more reliable emissary. — ALEXANDER C. BROWN'25, *Secretary*, Emery Industries, Inc., 4300 Carew Tower, Cincinnati 2, Ohio.

Indiana Association of the M.I.T.

Ivan J. Geiger, Director of Athletics at M.I.T., gave a highly stimulating talk to the Indianapolis Alumni on January 7, following a dinner at Atherton Center, Butler University. News of Technology, the staff and sports, the last high-lighted by movies, was thoroughly enjoyed. The occasion was utilized to invite local high school guidance counselors and prospective students and their fathers to become acquainted with the less serious side of M.I.T. It was a revelation to all that there is so much recreational activity among the hardest working students in the country. Such general participation is a tribute to Professor Geiger's program. About 27 people were present, most of them guests, who took home a vital picture of the impressive institution on the Charles.—EDGAR B. GODLEY'26, *Secretary*, 6025 North Oakland Avenue, Indianapolis 20, Ind.

The M.I.T. Club of the Kanawha Valley

The initial meeting of the year was held in the "tent" at John Pauley's South Ruffner Coffee Shop. At this highly informal affair, H. E. Lobdell'17 brought some

30 cigar-smoking Alumni up to date on affairs at the Institute and gave plans for the future. With sawdust on the floor and beer on the table, the group enjoyed a very pleasant evening.

It is with sadness and regret that we note the passing of Irvin L. Murray'26, who died January 9th. Mr. Murray had long been one of the leading Alumni in this area. — JEAN P. LEINROTH, JR., '48, *Secretary*, 1512 Barberry Lane, Charleston 4, W.Va.

M.I.T. Club of Kentucky

Our 1952 season got off to a good start on January 8 with a reception and dinner for H. E. Lobdell'17 at the Pendennis Club, Louisville. Lobbie was a most welcome and entertaining visitor and his photographic memory brought us up-to-date news on friends in almost every class range. Vice-president Craig P. Hazelet'18 presided in the unavoidable absence of President Archie P. Cochran'20. Among those attending the social hour and dinner were: Everett C. Brown'23, Kennedy H. Clark'33, John H. Dedrick, Jr., '48, Donald D. Dissly'43, Albert L. Entwistle'26, Walter E. Johnson'51, Harry J. Lichtefeld, Jr., '43, T. R. Metzger'50, Albert M. Prentiss'25, Charles C. Smith'27, Bill Smith, a recent arrival from the General Electric Company, Frederick H. Stover '10, Fred C. Wagner'24, Thomas P. Waldron'48, and Frank P. Wardwell'38. Many members who were unable to attend because of the short notice and post-holiday business trips called or wrote to send their regards to Lobbie and to express their interest in club activities. L. H. G. Bouscaren'04 and John Barriger'21 sent best wishes from the Chicago Club.

Quite a few Alumni are moving to Louisville in connection with the new G.E. plant and other interests here. We want to keep them posted on classmates and near classmates in this area and our Louisville members will also be glad to help the newcomers in any other way they can, such as contacts with local engineering society chapters, civic groups, and so on.

Only a few of us were able to attend the Chicago Club's October meeting at French Lick Springs. Our hospitable Chicago friends really staged an excellent affair, and we hope that more of us can accept their future invitations. Plans are under way for a picnic just as soon as spring weather sets in, and we hope to have one or more guests from Cambridge at that time. — FRANK P. WARDWELL'38, *Secretary*, American Air Filter Company, Inc., 215 Central Avenue, Louisville, Ky.

The M.I.T. Club of New York

Our Silver-Stein Award Dinner will have made history at the time of this issue. We concentrated all our efforts for the last three months in making sure that the Silver-Stein Award Dinner would be a

success this year and would become an annual dinner looked forward to by all M.I.T. Alumni. Bill Foster'18, Deputy Secretary of Defense, was the main speaker. Dr. and Mrs. Compton, H. E. Lobdell'17, Dean and Mrs. E. P. Brooks '17, Dean and Mrs. E. F. Bowditch'22, and, of course, Dr. and Mrs. Killian'26 were among our honored guests. We reserved the Starlight Roof of the Waldorf-Astoria on February 15 for this occasion.

The purpose of the Silver-Stein Award is to recognize a past or present club member who has made an outstanding contribution to the Club, to the Institute, or both; or who, by his consistent activities over a long period of time, has furthered the interests and welfare of the Club or the Institute or both. A five-man committee, picked by the board of directors, and with the present or a past president as chairman, makes the selection each year with the approval of the board of directors.

Dr. Killian presented this year's Silver-Stein Award to Lester D. Gardner'98, in recognition of his active leadership of the Club during the period prior to World War I and during that war, in recognition of his close interest and support of the Club over a period of 50 years, and in recognition of his service on Institute and alumni committees over these many years.

Our dinner-dance, scheduled for December 14th, was canceled so that we could concentrate on the Silver-Stein Award Dinner. The remainder of our functions for this spring are a dance on April 18, the annual meeting on May 7, and our golf party approximately June 3.

The M.I.T. Club of New York challenges the world! We are putting up an interclub trophy to be awarded at the annual golf party for the low gross. The club whose member has low gross wins one leg of the trophy, and three legs retire it. Every M.I.T. club in the world is invited to participate in this international golf tournament.

Socks Kinsey'24, chairman of the award dinner, and his committee are to be congratulated for the good job well done. Pete Grant'35 did a grand job in organizing this affair and all our other functions. — RALPH C. WILTS'41, *Secretary*, American Blower Corporation, 50 West 40th Street, New York, N.Y.

M.I.T. Club of Schenectady

We have had three more meetings since our last note in The Review. Two luncheon meetings were held at Ferro's Restaurant on Barrett Street in Schenectady, and the annual dinner meeting was held at the Edison Club in Rexford. On November 27, N. L. Freeman, Secretary of the Board of Examiners of the University of the State of New York, and R. M. Ellsworth, chairman of the Membership Committee of the Schenectady Profes-

sional Engineers Society, addressed 25 members of the Club at our third luncheon meeting. Their subject was the need for unity in the engineering profession and the methods which the professional engineering societies are taking to accomplish their unity. Both men gave speeches which were well received and provoked an interesting discussion.

On December 21, E. C. Burhmaster, Civil Defense Administrator for Schenectady County, told the Club about the civil defense plans for the area. Mr. Burhmaster showed some of the instruments which had been developed specifically for civil defense work and explained their use. Much interest was shown by the 21 club members present, and everyone was impressed with the seriousness of the problem.

The Club was fortunate in obtaining Professor J. P. Den Hartog, of the Department of Mechanical Engineering at M.I.T., as a speaker at the annual dinner meeting, January 15. His topic, "Vibrations," was in a popular vein and was enlivened by the use of models and by Professor Den Hartog's witty approach. He also favored us with news of the latest doings at the Institute. Some 42 Alumni, their wives, and friends were in attendance. — ROSWELL W. AUSTIN '42, *Secretary*, 1262 Lowell Road, Schenectady, N.Y.

CLASS NOTES

• 1890 •

Charles H. Alden, architect, died of a heart attack September 27, 1951, at Seattle, Wash., where he had lived at the University Club most of the time since 1906, and where *Life* magazine for September 8, 1941, had a picture of him captioned, "An architect who designed many of the city's distinguished buildings and homes, who takes special pride in the Club Library which he founded, assembled and decorated." Born in Massachusetts, much of his boyhood was in the West, and before coming to Technology he had studied at the University of Minnesota. His early architectural experience was in the office of Cram and Wentworth, and later with Shepley, Rutan and Coolidge where he became superintendent and office manager. In 1906 he went to Seattle as local manager for John Galen Howard, architectural director of the Alaska Yukon Pacific Exposition of 1909. Because of his work there he was selected to take charge of the architectural department of the Panama Pacific Exposition which opened in San Francisco in 1915. Soon his work in Seattle was again interrupted when, as a National Guard Reserve Officer, he was called to active duty in the first World War. As captain in the Construction Quartermaster's Corps, he served at Rockford, Ill., in Boston, and in France. Classmates will remember his appearing in uniform at our reunion at the Ocean House. Before retiring, he had reached the rank of colonel. He was a member of the Military Order of the Loyal Legion, and commander of the Commandery of

the State of Washington. In the December, 1951, *Journal of the American Institute of Architects*, Clyde Grainger has written of Alden, after the War: "He reopened his Seattle office and in the years to follow gave generously, joyously, effectively to public service as a member of city, and later county, planning commissions. He served as regional director of The A.I.A. for the old Western Mountain District which in those days stretched from Colorado to Alaska; was president of the Seattle Fine Arts Society; member of countless committees; Editor of the Washington State Chapter's monthly Bulletin; contributor and correspondent to many publications and magazines. . . . His work is distinguished by the same characteristics as the man himself: integrity, meticulous accuracy, careful planning and conscientious execution. To those who knew, respected and loved Charles Alden, his monument is, for want of a more precise term, of the spirit."

John L. Batchelder died in Boston January 6, 1952, after a short illness. He graduated in Course VII, and boasted last Alumni Day that his presence established a record of 100 per cent for '90's Course VII living members. Immediately after graduation, the *Boston Herald* states: "He entered the coal business which had been established many years earlier by his father. Together with a brother he operated the business under the name of Batchelder Brothers until 1929, when the concern was organized as the Batchelder-Whittemore Coal Co., of which he was treasurer. He was also a director of the Burton-Furber Coal Company." "Johnny Batch," as we called him, was always interested in athletics: boxing and track at M.I.T., but especially rowing, which he organized. At our 55th anniversary he told us he still continued this on the Charles, but at our 61st he confessed he had stopped "because the Radcliffe crew splashed him." Again quoting the *Herald*: "Long associated with the Boston Lying-in Hospital, he had served it as vice-president from 1925 to 1928, president from 1928 to 1939, and as trustee since 1941. He was also for many years a trustee of the Farm and Trade School on Thompson's Island, Boston Harbor." His interest in historical matters was evidenced by his contributions to the State Street Trust Company brochures. To his wife, whom we have often enjoyed meeting at our reunions, and to his family we extend our sympathy.

Conning the life stories of these classmates, the Secretary is again impressed with the broad interest exhibited by the graduates of that period in cultural affairs, philanthropies, and civic duties. These are objectives M.I.T. is today broadening its training to cover more fully. We do not doubt the wisdom of the present plans, but is it that students coming to Tech "know more and more about less and less"? Send in suggestions for these notes. Flint and Packard are again in Florida; the former at 3726 First Avenue North, St. Petersburg, and the latter at Longwood. — GEORGE A. PACKARD, *Secretary*, 53 State Street, Boston, Mass. CHARLES W. SHERMAN, *Assistant Secretary*, 16 Myrtle Street, Belmont, Mass.

• 1892 •

The Secretary has just received notice of the death of Barron P. DuBois on January 3, 1952, in the Bethesda Naval Hospital in Washington. He graduated with us in Electrical Engineering in 1892 and those of us who were on the teaching staff of M.I.T. remember him well as an instructor in the Steam Engineering Laboratory from 1893-1895. He left the staff in 1895 to accept a commission as assistant paymaster in the Navy with the rank of ensign and was promoted through the various grades to rank of captain in the Navy Supply Corps in 1917. After 30 years of service he retired in 1925. He continued his residence in Washington after that time, however, going to Marblehead, Mass., for summer vacations. The Secretary is indebted to the *Evening Star*, Washington, for the following account of his career: "Born in Chelsea, Mass., Capt. DuBois was the son of Navy Capt. and Mrs. Francis L. DuBois. He was graduated from . . . Technology in 1892 and was an instructor at the school for two years before receiving an appointment as a paymaster in the Navy in 1895.

"A veteran of the Spanish-American War, the Philippine Insurrection and World War I, Capt. DuBois retired from the Navy in 1925 and settled here. Capt. DuBois, a member of the Military Order of the Loyal Legion, the Appalachian Mountain Club and the Army and Navy Club here, had maintained a residence at 3317 Rowland Place, N.W., for many years, but was living at the Wardman Park Hotel at the time of his death.

"He is survived by his widow, Mrs. Helen Hodgkin DuBois of the Wardman Park; two sons, Comdr. Francis L. DuBois, U.S.N., stationed at San Diego, Calif., and Comdr. Thomas H. DuBois, U.S.N., stationed at Cartagena, Colombia; a daughter Mrs. Ellery Huntington, Darien, Conn. and three grandchildren."

A month ago the Secretary received a very interesting letter from Wesley Haliburton of Memphis, Tenn., who was with us for one year taking professional work in Civil Engineering in structural steel, under Professor Swain, and more advanced work in applied mechanics under Professor Lanza. He states: "I have been receiving The Technology Review for a long time and am, to some extent, familiar with the widening scope of the Institute and the greatness of its work along engineering and scientific lines, and I hold this school in greater esteem as the years pass by." He states that he has retired from active business life, is very interested in any plans which may be made for our 60th reunion next June, and hopes that he may be able to be present. He celebrated his 60th reunion at Vanderbilt University last June, from which he graduated before coming to . . . Technology.

For reasons of health he gave up the practice of engineering about 50 years ago and went into the land-development business in Tennessee, purchasing some two or three thousand acres of cutover timber lands and selling them in tracts of fourth acres or so, helping the purchasers to build houses and clear the

land with ample time to pay. He states further: "I've been living with one good woman for 54 years and we are the parents of the late Richard Halliburton, Princeton '21, world traveler, writer, and lecturer. He was lost in the Pacific, March 1939."

The Secretary hopes the foregoing will start our class members to making plans to attend a modest celebration of our 60th reunion, regarding which you will hear from him shortly. — CHARLES E. FULLER, *Secretary*, Box 114, Wellesley 81, Mass.

• 1893 •

Frederic Wait Lord, another loyal member of our Class, passed away at the New York Hospital on December 31. He was born in Brooklyn, N.Y., on July 3, 1871.

As president of the Lord Electric Company, which he founded in 1895, he built up an enviable reputation for himself and the company, which is now one of the largest electrical contracting concerns in the United States. At the time of our 30th anniversary meeting, his firm had installed the electric wiring for such buildings as the Knickerbocker Hotel, Plaza Hotel, New York Public Library, and the Metropolitan Tower in New York City. More recent contracts include the electrical installations required for such projects as La Guardia Field and Idlewild Airport.

In a desire to help serve the industry to which he devoted the study of a lifetime, Lord wrote numerous pamphlets and several books, including *Changes and Extra Work, the Bane of Contracting; Competitive Bidding on Cost-Plus Contracts; Ethics of Contracting and Stabilizing of Profits; Fair and Unfair Competition; The Negotiated Contract* (1942), for which he received commendation from the Office of the Chief of Engineers of the War Department as well as a letter from the President; *Selective Methods of Letting Contracts*; and culminating with *Contracting as a Profession*, published in 1949. The latter book has been given wide circulation among students in several colleges, including M.I.T.

He was an honorary member of the New York Electrical Contractors' Association, and in 1942 was cited for "long and useful service and helpful suggestions for improving the letting of contracts" by the National Electrical Contractors' Association. During his senior year at Technology, Lord was captain of the track team. He was unusually interested in all forms of athletics, and played practically every game from ping-pong to polo. In addition, he invented National Tennis Tapes. He was a member of the Theta Chi Fraternity, and the Engineers, Uptown, and Racquet and Tennis Clubs of New York. His hobby was his workshop, where he could make or mend almost anything in wood or metal. Among his friends his kindness was an outstanding characteristic, and his helpful suggestions in time of need were greatly appreciated.

He is survived by his wife, the former Mrs. Alice Kirkham Garrison, whom he married on September 29, 1906; three daughters — Mrs. Wolcott E. Andrews,

Mrs. Mary Lord Reed, and Mrs. Robert G. Pierce; a stepdaughter, Mrs. Carl Binger; a stepson, Lloyd K. Garrison; and two sisters — Harriet Lord and Mrs. Edgar V. Frothingham.

We also regret to report that Arthur G. Farwell, Course VI, died on January 20, 1952. From the New York *Herald-Tribune*, the following biographical material concerning our classmate is taken: "Arthur Farwell, seventy-nine, composer, former music publisher, teacher and critic, died yesterday in Lexington Hospital after a short illness. He lived at 684 Riverside Drive. Mr. Farwell was noted for his orchestral compositions based on Indian music and legends. In 1939 he won the National Federation of Music Clubs competition with 'Mountain Vision,' which was No. 6 in a series of orchestra works called 'Symbolistic Studies.'

"Born in St. Paul, Minn., Mr. Farwell was graduated from . . . Technology in 1893 with a degree in electrical engineering. He turned to music, however, and studied composition for six years under Homer Norris in Boston, Engelbert Humperdinck in Germany, and Alexandre Guilmant, in Paris. On his return from abroad, he lectured on the history of music at Cornell University until 1901 when he founded the Wan-Wan Press in Newton Center, Mass., and in the next ten years published the works of thirty-seven American composers, most of them using American folk themes. While he was a music publisher, Mr. Farwell made four transcontinental tours, lecturing and giving recitals, and established the American Music Society, of which he became president. He also was chief critic for 'Musical America,' and supervised municipal music at parks and recreation piers in New York City.

"From 1918 to 1939, Mr. Farwell was a teacher of music, first at the University of California in Los Angeles and then in Berkeley, Calif., and finally at Michigan State College, where he headed the music theory department. Some of his better known compositions were 'The Gods of the Mountains,' 'Dawn,' 'The Domain of the Hurakan,' 'American Indian Melodies,' 'Navaho War Dance,' 'Pawnee Horses,' and 'Mountain Song.'" — FREDERIC H. KEYES, *Secretary*, Room 5-213, M.I.T., Cambridge 39, Mass. GEORGE B. GLIDDEN, *Assistant Secretary*, 38 Chauncy Street, Boston 11, Mass.

• 1894 •

A very cordial letter from Jim Kimberly from his winter home in Tryon, N.C., corrected a statement made in the December notes. He very modestly states that he was never president or chairman of the board for the Kimberly-Clark Company of Neenah, Wis., but all who know him also know that his activity in that corporation was long, very active, and highly responsible. His sons, Jack and Jim, are carrying on the business which has greatly expanded in the last few years. For many years, and perhaps also now, this company was the sole supplier of the paper widely used for brown pictorial supplements.

Replying to a letter of inquiry, George Haven sent a most interesting account of

some of his activities since his retirement as professor of machine design at M.I.T. in 1936. For several years he was busy in numerous operations, including real estate, on his broad and beautiful acres overlooking Lake Winnepesaukee. George's letter is quoted, as many classmates will be glad to hear from him: "Route No. 4, Laconia, N.H., January 2, 1952. I thank you greatly for your kind letter of December 14 and your expressions of sympathy over my physical downfall. I guess, if the truth be told, I tried to do a little too much in my old age. About six years ago I got a splendid job as inspector of used textile machinery for foreign export with Robert W. Hunt Company of New York City. It was a very relishful task, traveling far and wide and making reports on consignments of textile machinery going to Egypt, Mexico, Paraguay, Uruguay, Chile, and many other foreign nations. The United States passed a law that no further consignments could be cleared unless a competent and impartial inspector would make a written report that the machinery was good for 10 more years of use. Unfortunately, the war was still in progress and I could not get sleepers — had to sit up all night in a day coach. I went to Atlanta numerous times in this fashion — 29 hours from Laconia one way. After a while I had a stroke and went bad from the hips down. My friends say I am splendid from the waist up but 'gone' the rest of the way down. So now I am a 100 per cent wheel chair artist. Two years ago I finished my last textile handbook, my 14th copyright. So I have not been loafing. Don't spread it on too thick with the boys. I don't have much pain and am as cheerful as Dickens' immortal cricket." Those of the "boys" who are left will sympathize and regret the enforced inactivity of one who has had such an active and useful career as teacher, writer, and industrial expert, and will hope that his serenity and cheerful philosophy will lighten the years ahead.

It is probably quite in keeping with natural law that after fourscore years our numbers should be gradually depleted. It is, however, with deep regret that the Secretary adds to the necrological record. The bare information of the passing of Charles G. French, 430 French Road, Utica, N.Y., has recently been received. Mr. French, who died on April 28, 1950, was a special student in Architecture for a short period during our student days. Throughout the period since, he practiced architecture and building in Utica, as far as available information indicates, but he has never had a close alliance with class affairs and response to notices has merely given his address and general occupation. Of more personal significance has come notice of the death of John N. Ferguson at St. Petersburg, Fla., on January 6 of this year. The Boston *Globe* of January 7 carries the following notice of his demise: "Word was received . . . of the death in St. Petersburg, Fla., of John N. Ferguson, 79, designer and developer of many of the Boston Harbor installations in the last half century. A resident of St. Petersburg for the past few years, he retired in 1939 after 45 years of service with the State

Department of Public Works. During his service with the department as a civil engineer with the Boston Harbor division, he developed such projects as the Charles River Basin, Commonwealth Pier, the South Boston drydock and piers in East Boston. A native of Scotland, he moved with his family when he was a boy to Canton and was a graduate of Canton High School and M.I.T., class of '94. Later the family moved to Mattapan and then to the Back Bay. He was a member of Blue Hill Lodge of Masons, St. John's Commandery, K.T., and Aleppo Temple. He leaves a wife, Jennie Louise."

The Class, and especially those who have attended the reunions in the first 40 years after graduation, will remember this quiet, warmhearted, modest fellow who was always among our best golfers but was silent as to his professional accomplishments though he had been an important factor in many of the improvements in the metropolitan district, especially in the development of the water supply, the sewage disposal system, the Charles River Basin, and the harbor and dock improvements. Early in his career he served with the Massachusetts Volunteer Naval Militia, leaving with the grade of first class seaman. He belonged to both the American and the Boston Society of Civil Engineers, and to the New England Water Works Association. He attended the meetings of these professional societies regularly and frequently reported articles pertaining to them for the *Engineering Record*. In 1898 he married Maybelle Jackson, who died a few years later. Subsequently he married Jennie Louise McIntyre, a graduate of Wellesley College in the class of 1905. There were no children. For several years following his retirement, they spent the winters in Florida, at first in Miami and later in St. Petersburg, but the mountains of New Hampshire drew them when summer days came. The Secretary regrets that he was unable to attend the funeral of this loyal and highly regarded friend who so efficiently upheld the honor of the Class and of his profession. — SAMUEL C. PRESCOTT, *Secretary*, Room 5-213, M.I.T., Cambridge 39, Mass.

• 1895 •

Your Secretary is somewhat grieved at not being able to report at least one news item of the Class for this issue of *The Review*. There have been few such omissions during the 27 years preventing the use of the "class pencil." Let's hope for better luck next month. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass.

• 1896 •

It is always a pleasure to have news from John Tilley, especially when it focuses on the '96 New York group, planning for their annual midwinter dinner to which your Secretaries have been guests these many years. A tentative date of February 18th has been discussed, with the New York Yacht Club as headquarters. Local news includes the report that Partridge is *status quo*, confined to his bed, yet cheerful under the monotonous grind. Ralph Henry's personal report of finding the New Hampshire winters to his

liking, together with an active interest in his daily rounds, is good news. Received a very welcome note from Perry Howard in which he speaks of the reunion at Swampscott as a most enjoyable occasion. A donation to the Benevolent Fund was enclosed. John Tilley enclosed in his letter one which he had received from Irving S. Merrell. In this he gives his new address, 345 Eighteenth Avenue, N.E., St. Petersburg 2, Fla. He tells of selling his house, which will be used by a doctor as a sanitarium. He has moved into a small house. He also mentioned having a grandson 14 years old, six feet, one and one-half inches tall. He has a sacroiliac joint which does not allow him to go fishing any more, so he gave his heavy fishing coat to this grandson and it was a perfect fit.

All of us respectfully acknowledge the opportunities of greater leisure, due in part to our appreciation and acknowledgment of and acceptance of boundaries determined by increasing years. Let us be alive and gay, and continue to add our mite if not might to the problems ahead. — JOHN A. ROCKWELL, *Secretary*, 24 Garden Street, Cambridge 38, Mass. FREDERICK W. DAMON, *Assistant Secretary*, 275 Broadway, Arlington, Mass.

• 1897 •

We have permission to copy, in part, a letter received by Jere Daniell from William R. Wood, XIII, who is retired and living in Danville, Calif. The letter is dated December 18, 1951. Bill writes: "We have been ding-donging along with no more than our share of aches and pains. The former are local. The latter are what we have about once a day when we hear the radio and read the paper headlines, Washington and Korea. Cheer up! Someone said that the three most comforting words in the English language are 'it will pass.' That is probably true, but a person may not live to see 'it.' Today we are having a nice gentle rain so I have a chance to stay indoors and write this letter instead of pruning apricot and walnut trees. The country is very nice and green with the feed and weeds coming up very prettily. I never get tired of seeing a brown, apparently dead, field come to life with a little water. Do you know water is one of our biggest headaches. Another one is the increase in population with all its problems—schools, roads, sanitary conditions, and so on, ad infinitum, not forgetting taxes. This county, Contra Costa, gained a population of from 100,000 in 1940 to about 300,000 in 1950. Danville was a nice little agricultural village when we came out here and is now becoming a suburban town. Guess we will have to move to Nevada where you can still legally 'bet your shirt' if you feel like doing so. Of course there is no gambling in California (?)."

A letter from Kennedy Buell of Glen Rock, N.J., advises that his father, Charles S. Buell, II, died on October 24, 1951, in Glen Rock, N.J. Charles was born in Huntsville, Ala., and attended Armour Institute of Technology from 1893 to 1896. He then came to M.I.T., taking his degree with the Class of '97. A brief summary of his professional career

is as follows: 1897-1898, telephone testing, Western Electric Company, Chicago; 1898-1904, sales engineer, Westinghouse Church Kerr, Chicago; 1904-1910, sales engineer, Allis Chalmers Company, Milwaukee; 1910-1921, manufacturer's agent, Allis Chalmers Company, Chicago; 1921-1923, manager, Nashua Gummed and Coated Paper Company, Middletown, Ohio; 1923-1925, assistant to the vice-president, Sorg Paper Company, Middletown, Ohio; 1925-1934, manufacturer's agent, Huntsville, Ala.; 1934-1937, superintendent, Admiral Braid Company, Huntsville, Ala.; 1937-1942, manufacturer's agent, Huntsville, Ala.; 1942-1951, electrical draftsman, Bethlehem Steel Company, shipbuilding division, Quincy, Mass. During and after World War I, he served on the U. S. Shipping Board and on the Claims Board of the Army Ordnance Department. He leaves one son; one other son was killed in action in World War II.

Benjamin A. Howes, VI, died in Walpole, N.H., on January 9, aged 76 years. A native of Keene, N.H., Ben was a consultant for 28 years in New York City on special construction problems. In 1934 he was staff engineer of the Federal Emergency Relief Administration. He served as senior engineer in the Resettlement Administration from 1934 to 1938, and from 1938 to 1942 he was senior engineer for the U. S. Housing Authority. He is the author of several books and articles on architecture and structural engineering, and was a member of the American Society for Testing Materials, Society of Military Engineers, National Society of Professional Engineers, and the Association of Federal Architects. He leaves one son, Benjamin T. Howes '39, a daughter, sister, brother, and six grandchildren. Thus passes another of our classmates who was at Osterville for our 50th reunion, making 10 in all of those who were present on that happy occasion who have gone "over the range."

We have received word, without further particulars, of the death some time in the middle of the summer of Henry F. Hoit, IV, retired, of Kansas City, Mo.

At the time of this writing, January 15, 1952, but four men have sent in suggestions as to a 55th reunion. It does not seem as if the fellows are interested, at least not enough to write to the Secretary. — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass.

• 1898 •

Our classmate-historian, Ernest A. Bragg of Milford, Mass., is continuing his literary activity. He writes: "As is my custom, I look in every *Technology Review* for news of '98 and seldom fail to find that for which I search. Herewith comes a copy of my latest literary effort. It is not a marvel of superfine writing, but within the covers are facts which have never before been recorded and which I trust may be of interest to younger generations. As I have worked on the different books of history, town officials have many times suggested that I write a history of the town. This I have now started to do and am enjoying searching out past events. Short articles in the daily paper have excited

considerable interest in long-forgotten facts in the history of the town. The death of my younger brother last December necessitated my going to Webster and living for some six months to settle his estate. Affairs have now reached the point where I am at home and again writing history. Was sorry to miss the reunion but I have been blessed with that disease called arthritis and for most a year have found it more comfortable to remain near a chair. Trust I may be able to be at the 55th."

Thanks, Ernest, for the letter and the attached book. The book is entitled *The Origin and Growth of the Boot and Shoe Industry in Holliston and Milford, Massachusetts, 1793-1950*. We have perused it with interest. The book is attractively bound in red cloth, with gilt title. There are 10 chapters, as follows: The Man Col. Ariel Bragg; The Infant Industry; The Adolescent Industry; The Transition Period; The Mechanized Industry; The Modern Industry; Accessories, 1795-1869; Accessories, 1869-1950; The Industry in Holliston; Accessories in Holliston. There are several illustrations: a photo of the author and one of Colonel Ariel Bragg; an etching, early methods of manufacture; and a map—Braggville, 1850 to 1880 (comprising sections of Holliston, Milford, and Medway).

We are indebted to Dave Fenner for the following information concerning our classmate, Henry F. Scott, as printed in the September 7 edition of the Falmouth, Mass., *Enterprise*, from which we quote, in part: "Committal services were held in Oak Grove cemetery . . . for Henry F. Scott of West Falmouth, retired Dennison Manufacturing Company engineer, a summer resident for many years and father of Miss Meredith A. Scott, marine artist. Mr. Scott, who was 75, was born in Brockton, Mass. the son of George Valentine and Charlotte (Talbot) Scott. After graduating from M.I.T. in 1898, he was associated for 30 years with Dennison Manufacturing Company, Framingham, where he was in charge of all machinery and mechanical maintenance. He designed several machines used by the firm. He was a member of the American Society of Mechanical Engineers and of the Plant Engineers club. A summer resident at West Falmouth for 33 years, Mr. Scott came here from Framingham with his daughter to live permanently in the fall of 1942. An enthusiastic yachtsman since 1937, when he acquired his yacht, *Cedria II*, Mr. Scott took an active part in affairs of Falmouth's Coast Guard Auxiliary flotilla. For two years during the war he served as navigation instructor. When, in 1943, Falmouth schools were feeling the pinch of the war-induced teacher shortage, Mr. Scott came forward and was appointed to fill the vacancy created by the resignation of Kenneth C. Ballard, high school science teacher. He was forced to resign his position six months later after suffering a heart attack. Members of the Lawrence High School graduating class dedicated their yearbook to him that spring. Since leaving his teaching post Mr. Scott had lived quietly at his West Falmouth home with his daughter, Meredith. Both were fond of the water and except for the war years spent sum-

mers on their yacht *Cedria II*. From their base in West Falmouth harbor they would make short cruises in Buzzards Bay, in Vineyard Sound and in and around the islands, often stopping so Miss Scott could sketch and paint. Because of the facilities offered, they had planned to spend this summer based in Falmouth Harbor and it was here that Mr. Scott was taken ill. He was a member of the U. S. Power Squadrons, serving as Lieutenant Commander of the Cape Cod division in 1949. He leaves in addition to Miss Scott, a second daughter, Mrs. C. Melville Chase, Jr., of Pittsfield, and two grandchildren, Scott Meredith Chase and Janet Meredith Chase." Henry and Miss Scott attended the Golden Anniversary, and many of our classmates will remember them pleasantly.

Lester Gardner has kindly sent us a newspaper photograph of an imposing mansion, under which is the description, "Main Residence on the large Pierce estate, located in Weston and Wellesley, purchased from the trustees by Roger Babson." Right on the march, Roger!—Our active President, D. W. Edgerly, advises that the firm of Tietig and Lee, architects, located in Cincinnati, Ohio, will celebrate their 40th anniversary in 1952. Congratulations, Rudolph and Walter! Send us a copy of the program or booklet, whichever you plan to get out, for the class notes. And, by the way, who else in '98 has continued in one company or partnership for 40 years or longer?

We wish to thank very especially those classmates who have been good enough to send us material for the notes about themselves and their families or about other classmates. If everyone will be quick to send in such items, the objective of diversifying the class notes will be achieved. As the Scotch proverb puts it, "Mony a mickle makes a muckle." And speaking about mickles and muckles, how about the Alumni Fund? Since the class agent letter was sent out on December 6, 1951, another year's interest, amounting to \$1,040, has been added to this year's figure, and there have been numerous annual gifts so that the total credited to '98 for this year, as of the first part of January, 1952, when these notes are being written, amounts to \$2,232. This exceeds the largest total that the Class has ever contributed in any fund year since the inception of the Fund. Further, there have been additional capital gifts. A classmate has sent in two \$500 bonds, of a value, including interest, of \$1,022.50. Another classmate has made a capital gift of \$100. Thus, the cash value of the '98 capital gift fund, as of the early part of January, 1952, is \$28,212.92. Time and '98 march on!

Our world-traveling classmate, George Cottle, is arranging for a party of eight to tour in Europe this coming spring and has been kind enough to include in the party the Secretary and his sister. Accordingly, after March 1, send items for the class notes to Elliott Barker. We bespeak hearty co-operation with Elliott. — EDWARD S. CHAPIN, *Secretary*, 463 Commercial Street, Boston 13, Mass. ELLIOTT R. BARKER, *Assistant Secretary*, 20 Lombard Road, Arlington 74, Mass.

By the time that this issue reaches you, it will be about time to be planning for the early summer. By unanimous request of those attending our reunion last June, we will have another reunion this year. That is to say, for three days beginning June 10th, the Pines at Cotuit, Cape Cod, Mass., will be available to us; and anyone of the Class of 1900 going there during these days will likely find some of his classmates there. There will be no program and no concerted effort to induce large numbers of the Class to come. Probably there will be but one mailing announcing the reunion. No advance registration will be asked, but the Secretary will appreciate it if any who expect to come will let him know. Alumni Day will be Monday, June 9th, and it is hoped that many of the Class will be there. Then, as last year, we will go to the Pines the next day, Tuesday, June 10th. Please make your own arrangements with the hotel manager, and address communications to: C. D. Crawford, Manager, The Pines, Cotuit, Mass. First come first served! Let the Secretary know if he can help you in any way.

Charlie Smith writes on January 10: "I am leaving in a few days for Brazil as consultant to the World Bank, international bank for reconstruction and development, in connection with a proposed loan to the Brazilian Railways for improvements, and will be gone several months." Good luck, Charlie, we hope you have a good time and a profitable one. This does not mean that all class interest in the Alumni Fund will be suspended in the absence of the Class Agent! Send along your contributions just the same and they will be properly taken care of.

A letter from Harry Morris from California indicates that he is carrying out the plans that we mentioned in the December notes. — We have received word that Albert B. Briggs, Course I, died at his home in Norwell, Mass., on November 2. Briggs had been a permanent resident of Norwell for the past 11 years. Prior to that time, he has spent summers there but had lived in Wollaston for 42 years. He was born in Boston, and, after graduating with us, was employed by the Boston and Albany Railroad for 40 years. He leaves his wife, Amy D. (Ferguson) Briggs; two daughters, Mrs. Kermit K. Kingsbury of Worcester and Mrs. Chester S. Higgins of Laconia, N.H.; and four grandchildren. — ELBERT G. ALLEN, *Secretary*, 11 Richfield Road, West Newton 65, Mass.

• 1901 •

I recently reported the death of Rosecrans Baldwin in Chicago, which fact I had just learned although his death occurred in October, 1950. Mrs. Peterson has been able to collect, through Langdon Pearse, some of the details which are as follows: Baldwin graduated from Yale in 1898 and then went to M.I.T. to gain some technical background on the textile industry. Sometime during his first term he was stricken with pneumonia, was forced by his doctor to convalesce in the South, and, on becoming well, decided not to return to M.I.T. but to enter busi-

ness. His great love for Yale and the short time that he was at Technology made his interest in 1901 almost negligible. However, he was a bona fide member of the Class and as such deserves notice. He was one of the founders of the Tenak Products Corporation which manufactures electrotype moulding material. He retired about 13 years ago due to ill health and died rather suddenly on October 21, 1950, from a heart attack.

The following is taken from the Boston *Herald*: "Walter D. Pratt of 9 Bancroft Ave., Beverly, Mass., who was for many years with the Flintkote Company of Boston and later with the Massachusetts Foundation of Boston, died on December 14, 1951. He studied at the University of New Hampshire and was graduated from M.I.T. in 1901. He leaves his wife Alice."

Langdon Pearse also sends us a clipping from the Chicago *Tribune* concerning our classmate DeBerard, from which I quote, in part: "A 25 million dollar appropriation for the construction of the city's new central district filtration plant near Navy pier has been tentatively set up in the 1952 budget. W. W. DeBerard, city engineer, and Oscar E. Hewitt, commissioner of public works, said the sum would be used to pay salaries and finance construction scheduled for next year. One of the larger expenditures slated for next year is for the construction of a cofferdam 6450 feet long and enclosing an area of 61 acres. When the dam is completed, lake water will be pumped from behind it so the plant itself may be erected on the land recovered. The complete filtration plant it is estimated will cost about 85 million. It will supply filtered water to all of the city and suburbs now getting Chicago water north of 39th street. Actual construction is expected to begin this spring. DeBerard said test bearings disclosed that silt and sand covering the construction site must be removed before building operations begin. The plant may be completed in about six years but it is hoped that it will be in partial operation much sooner."

Langdon Pearse also says that F. W. Puckey is still practicing architecture in Chicago, specializing in hospitals and institutions. Not long ago I reported about the events which took place upon the resignation of A. W. Higgins as president of the Florida Power Corporation. It seems fitting at this time to say something of his latest honor. The newest plant of the Florida Power Corporation has been named in honor of Al. The first unit of this station was completed in May, 1951, and now has a capacity of 45,000 kilowatts. When the two remaining units are completed in 1953 it will have an ultimate capacity of 135,000 kilowatts. Each unit requires 550,000 barrels of fuel oil annually. The dedication of the new plant took place in November, 1951, and I quote the following from a Florida paper: "The dedication of the Higgins plant in honor of former Florida Power Corporation President Albert Willis Higgins is a tribute to one of the most dynamic industrial and civic leaders ever to make his mark on the State of Florida. As president of the company from 1937 until his retirement in May 1950, Higgins led Florida Power through

a series of developments unparalleled for surprises and excitement in the utility field. A 'transplanted' Floridian, like many of the state's residents, Higgins was born in Boston May 31, 1880, son of Charles Willis Higgins and Mary Vail Canfield. He attended public schools in Newton, Mass. and was graduated from high school there in 1897. In 1901 he received a B.S. degree from M.I.T. He is married to Frances Stephens Bush of New York City. After an initial period of engineering work, Higgins entered the public utility field as superintendent and general manager of the LaCrosse Gas and Electric Co. in Wisconsin in 1912. From that time until his retirement he never left the utility field. The most spectacular period in Higgins' brilliant 38-year career in the public utility field began in 1945 as soon as wartime restrictions were a thing of the past. Realizing that the area Florida Power served would undergo a period of terrific expansion, he began at once to put his company in a position to pace that growth. With a colorful pageant 'Florida Power on Parade' he took FPC officials to New York City attired in bright jackets and accompanied by fresh oranges and bathing beauties to sell investment bankers and insurance executives. This momentous excursion resulted in Florida Power's breaking away from holding company control and being proudly represented, beginning November 1945, on the New York Stock Exchange by its very own symbol, FDP. Some of his other spectacular 'productions' were plant tours for members of the clergy; a dividend check resplendent in four colors, portraying a typical Florida fishing scene; a tremendous public relations gesture in 1949 which saw 100 investment bankers, financial editors and insurance executives taken from New York, by private train and buses, on a four-day tour of company territory and state industries. Both 'Florida Power on Parade' and the 'Bankers Tour, were covered by text and pictures in *Life* magazine and other national publications. An editorial on the announcement of his retirement was captioned 'No Civic Retirement for Hig,' eloquent testimony to a man whose leadership in community, state and industrial affairs has been so constant and outstanding that his retirement simply was not considered a statement of withdrawal from public life."

I have received from Ed and Mrs. Davis a card with an eight-verse New Year's greeting. Ed evidently has an internal factory for manufacturing verse. When it is full it runs over and gives us something to think about and enjoy.

Word has just come to me of the death of Charles B. Coburn, XIII, of Worcester, Mass., on December 4. I also report with regret the death of Frank Holmes in Florida on January 4. The following is taken from clippings sent me by Al Higgins, who will attend the funeral and see that a tribute is sent from the Class. V. Frank Holmes, aged 74, retired technical engineer, passed away in a St. Petersburg hospital on January 4. He had been a winter visitor for several seasons from Amherst, N.H., but for the past year had made his home in St. Petersburg. He is

survived by his wife, two daughters, a sister, and an aunt.

Don't forget to reply to the Class Letter. — THEODORE H. TAFT, *Secretary*, East Jaffrey, N.H. Willard W. Dow, *Assistant Secretary*, 287 Oakland Street, Wellesley Hills 82, Mass.

• 1902 •

Through the inspiration of Adrian Sawyer, The Review has kindly arranged to have a copy sent to each member of the 50-year Class each month of this school year. The 50th Reunion Committee is therefore making use of The Review to keep before the members of the Class, who have not to date indicated any interest in the affair, the opportunity of spending a few days of happy relaxation in company of the fellows who 50 years ago were frequenting the lecture halls and classrooms of old Rogers, Walker, and Pierce Buildings of our "Stute" on Boylston Street. Many late letters are coming in and the outlook for a very sizable gathering is encouraging. Dan Patch and his subcommittee chairmen are going to make it hard for anyone who gets down to the Cape not to have a good time. If you have mislaid your card, just drop me a line and I will send you an application for a reservation when they go out in March, which by the way is about the time you will read these notes written in January.

A notice of the death of Murray Walker in March, 1951, has been received. — BURTON G. PHILBRICK, *Secretary*, 246 Stuart Street, Boston 16, Mass.

• 1903 •

We have received two notes from the Alumni Office. George E. Kershaw, Course XIII, has a new address; namely, 43 Fairwood Road, Madison, N.J. The old address was Seattle, Wash. The other note states that John W. Regan, for many years master of one of Boston's high schools, but retired some two or three years ago, has gone to Florida, with the new address of Palm Island, Miami Beach. Also included among men who have gone to Florida are, as usual, Hewitt Crosby and Regestein, and I presume others will be there. Your Assistant Secretary came out of retirement last July, and is still at work on titles for one of the natural gas transmission companies extending its lines into New England. Don't forget that your Secretaries need to hear from you if we are to appear on the pages of The Review from month to month. — FREDERICK A. EUSTIS, *Secretary*, 131 State Street, Boston, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, Box 103, South Wellfleet, Mass.

• 1904 •

We were delighted to receive Christmas cards from a few classmates; among them, Henry Stevens, Frank Davis, Bill Eager, the Guy Palmers, the Langs, the Whitakers, the Haydens, and the Anthonys. Ralph Hayden's card brought news of Dwight Fellows who in the course of his wanderings had reached the Hayden home in Nevada and spent a few days. Guy Palmer sent a picture of his new house which looked very attractive. The

Anthony's suggest that '04 members start now in collecting interesting photographs of themselves, their families, and their homes and they volunteer to get them in shape for showing at our 50th reunion.

If any of you want to buy a chicken farm, apply to Charlie Homer. He is about once more after his heart attack but is going to take the doctor's advice and slow down, which means disposing of his poultry. — We suggested to Louis Bouscaren that he use the class notes to promote his efforts as Class Agent for the Alumni Fund, but nothing has come through for publication. It is in order to suggest, however, that if any of you have received notices from him, get out your checkbook and make him happy.

We looked for the name of Cy Ferris among the list of passengers on the snowed-in streamliner in the Cascade Mountains, but didn't see it. Cy commutes to the Pacific Coast to look after his lumber interests and you never can tell whether he is on the West or East Coast or in transit.

No retirements have been reported since our last edition but we regret to record two deaths. George Landrus, Course III, passed away at Miami, Fla., on September 7, 1951, and Herman E. Thompson, Course II, at Lowell, Mass., on December 17, 1951. No further information regarding Landrus is at hand, but the following regarding Thompson is quoted from the *Lowell Sun*: "He was born in Lowell, the son of the late Henry and Ellen (Straw) Thompson and made his home in this city until he had completed his education. Following his graduation from . . . Technology where he received the degree of B.E. in mechanical engineering with the class of 1904. Mr. Thompson accepted a position in his chosen field with the Amoskeag Mfg. Co. in Manchester, N.H. and was connected with that firm in an executive capacity for a quarter of a century. In 1929 he moved to North Tewksbury where he operated his own farm until his retirement shortly after the end of World War II. Active in Masonry in the New Hampshire jurisdiction Mr. Thompson was a 32d degree Mason and held membership in both the York and Scottish Rite Bodies as well as having been a member of the Shrine. He is survived by four sons, E. Tracy Thompson of Dover, N.H., Henry A. Thompson and William A. Thompson both of Los Angeles, Calif. and Albert W. Thompson of Bath, Me.; three granddaughters, Miss Ellen Straw Thompson, Miss Mary Ann Thompson and Miss Susan Elizabeth Thompson, all of Bath; and a grandson, David Tracy Thompson of Lowell." — EUGENE H. RUSSELL, JR., 82 Devonshire Street, Boston 9, Mass. CARLE R. HAYWARD, Room 8-109, M.I.T., Cambridge 39, Mass.

• 1906 •

The May, 1950, notes had occasion to refer to an article in the *Atlantic Monthly* by Dr. James H. Means about socialized medicine in Great Britain. The *Boston Globe* of December 16, 1951, included an account of a ceremony on the previous day at the Hotel Commodore, New York, in which Dr. Means was awarded a \$500

prize by the Sidney Hillman Foundation as author of the paper in question. Dr. Means spent his freshman year with us at the Institute and then transferred to Harvard where he received his A.B. and M.D. degrees. At the time of his retirement from Massachusetts General Hospital, Boston, he was director of the Department of Internal Medicine. He is now a physician in the Medical Department at Technology. It is expected that his major college affiliation is Harvard, but it is interesting to note he has now resumed his association with M.I.T. Extracts from Dr. Means's remarks in accepting the award follow: "I would prefer to see the nationwide medical care problem resolved by private endeavor. But I am convinced that if it is not so accomplished, it will become necessary that it be done by government. There has been no progress in the social, economic and political aspects of medicine at all comparable to that in the field of natural sciences. Experiments must be made in the humanistic areas of medicine no less than in the biological. The horse and buggy doctor was magnificent in his day, but he has no place in the present and future scene." Recalling his days as a hospital intern 40 years ago, Dr. Means traced the medical progress by which such diseases as typhoid fever have almost disappeared; while diabetes, pernicious anemia and subacute bacterial endocarditis, once fatal, are now readily reduced. "The average age of patients in the medical ward at Massachusetts General Hospital in 1912 was 35; today it is 51. Years have been added to the average length of human life; today we are faced with medical and sociological problems of an aging population. No one could have foretold these things in 1900," he said.

The Secretary attended the meeting of the Boston Luncheon Club on January 17. The only other '06 man there was Sam Ware, XIII. Sam has retired and resides in North Abington, Mass. Readers may recall we had occasion to refer to him in the February '50 news with reference to his daughter, Martha, who is a practicing attorney and one of the selectmen (or should we say a selectwoman?) of Abington; she is also one of the two women members of the Massachusetts State Legislature.

On a visit to the Alumni Office about January 15, the Secretary learned that some of the members of the Class have already contributed to the 1951-1952 Alumni Fund, which was reactivated last fall following its temporary discontinuance during the Development Fund drive. Subscriptions are now in order, as the fund year closes on June 30. Classmates still paying to the Development Fund may contribute to the Alumni Fund if they so desire. Already some members of the Class have generously given to them both.

Under date of December 29, the Secretary received notice that Abe Sherman had arrived at his usual winter resort, Sarasota, Fla. Frank Benham and his wife started for Miami on January 25, but may have returned by this time, as they usually limit their trip to a month or six weeks. — JAMES W. KIDDER, *Secretary*,

215 Crosby Street, Arlington 74, Mass.
EDWARD B. ROWE, *Assistant Secretary*, 11 Cushing Road, Wellesley Hills 82, Mass.

• 1907 •

From a clipping from the *New York Times* of December 28, which was thoughtfully sent to me by Hugh Pastoriza, I learned of the sudden death on December 27 of our classmate, John Milton McMillin. It seems that Jack had left his home at 435 East 42d Street, New York, to go to work at his office at 60 Wall Street, but he was stricken while on his way and died practically immediately and painlessly. Jack was a graduate in the Course in Mining Engineering. He worked as a surveyor and assayer in Mexico for about a year after graduation and then became a cadet engineer with the Denver Gas and Electric Company. In 1910 he became sales manager for a concern known as the Improved Appliance Company, which was a subsidiary of Cities Service Company, and four years later became associated with the bond department of Henry L. Doherty and Company. From 1920 to 1946 he directed the issue and sale of securities distributed by Cities Service Company and its subsidiaries, and negotiated their principal bank credits, becoming a director of the company in 1922 and vice-president in 1940. He was a director and member of the executive committee of Empire Gas and Fuel Company, and was also a director of Cities Service Refining Corporation, Cities Service Oil Company, Ltd., Cities Service Oil Company of Pennsylvania, Arkansas Natural Gas Company, Arkansas Louisiana Gas Company, Sixty Wall Tower, Inc., and Sixty Wall Street, Inc. He was a member of the University, Deepdale and Westchester Country, West Side Tennis, Broad Street, and River Clubs of New York and the University Club of Chicago. He is survived by his widow and two sons, Leslie and John M., Jr. As soon as I learned of his death, I wrote a note of sympathy on behalf of our Class to Mrs. McMillin and have received an expression of appreciation from her and her two sons.

Through the courtesy of Howard Chase of our Class, I received a clipping from *American Metal Market* of January 5, which announced that John C. Kinnear of our Class had been appointed assistant to Defense Mobilizer Charles E. Wilson, especially in connection with metals and minerals. John had been vice-president in charge of operations, in the United States and South America, of Kennecott Copper Corporation for the past seven years and retired on December 31, 1951. After receiving his degree in Mining and Metallurgy in 1907, he went to southern Nevada to work as a miner in gold mines, and in 1910 he became associated with Nevada Consolidated Copper Company, which later became the Nevada Mines Division of the Kennecott Corporation. He is a past president of the Mining and Metallurgical Engineering Society, and for 20 years was president of the Nevada State Board of Education. We extend to Jack our congratulations on his successful career and on his recent appointment to an im-

portant post in our national defense organization.

Through Hugh Pastoriza I have learned that William S. Lucey has retired from his work with Rayonier, Inc. His residence address is 112 East 74th Street, New York City. — Hermann W. Mahr is living in Washington, D.C., where he has been for some time, but his present address is 2012 The Berkshire, 4201 Massachusetts Avenue, N.W., Washington 16. — Phil Walker, Gene Banfield, and I attended an interesting meeting of the M.I.T. Club of Central Massachusetts at Worcester, Mass., on January 14.

At the time that you are reading these notes, only about three and one-half months will remain before our 45-year reunion occurs at Oyster Harbors Club, Osterville, Mass., the exact dates of this event being June 20 to 22, 1952. I hope that all of you who have previously indicated your expectation of attending this reunion, and also those of you who may not have previously made up your minds regarding your attendance, will reply favorably to the reply sheet which you will receive from me soon in connection with publicity and final notice regarding this gathering, which promises to be as successful and enjoyable as reunions which we have held in the past. — BRYANT NICHOLS, *Secretary*, 23 Leland Road, Whitinsville, Mass. PHILIP B. WALKER, *Assistant Secretary*, 18 Summit Street, Whitinsville, Mass.

• 1909 •

About a year ago, as recorded in these notes, Uncle Sam pulled Jim (XIV) and Ruth Critchett from their peaceful retirement at Orleans on the Cape in Massachusetts and made effective use of Jim's experience and ability on the National Production Authority to assist in the armament effort. Recently, he has been able to sever, in part, his connections with N.P.A. but he is still retained as a consulting authority. In a recent letter, Jim tells the story: "It is true that I have gotten away from the National Production Authority as of last November first, after 11 months service, but not completely so. Under strong urging I have accepted a consulting connection which will take me back for two or three days every other week. However, the civil service job is over as far as I am concerned.

"I had undertaken to organize and get smoothly running the alloy steel section of the Iron and Steel Division of the N.P.A. It had to do with the scanning of all orders placed on steel mills and foundries which called for the use of alloys, especially those in short supply. The object, of course, was to give the military program the greatest amount possible but at the same time see that the civilian needs were taken care of. The title was 'Assistant Director of the Iron and Steel Division.' In the course of a month, 50 to 60 thousand steel orders had to be looked over and a decision made as to the amount and kind of alloying ingredient to allow for each application and to allocate the proper amount of alloying metal to each of the 1,200 or more users so that the orders could be filled. It finally built up to about 150 personnel, 20 to 25 per cent

of whom had to be highly-skilled metallurgists. That in itself was a full-time job but, in addition, the Commerce Department wished on me a second full-time job representing the United States on one of the International Materials Committees. That work grew out of the agreement by President Truman and Charley Wilson to sit down with other friendly nations and stimulate production and agree on the equitable division among the countries of the scarce materials needed for war production. My committee handled tungsten and molybdenum. There were 13 countries represented on it and the work was quite intricate since it involved stimulating mining production, attempting to stabilize world markets, and intelligently deciding the real need of the various countries for those two metals. At times, the work of the committee was carried on in three languages with the use of interpreters. Such work was, of course, slow and called for considerable knowledge as well as diplomacy, but was very interesting. The work got off to a good start and I left the committee well on the road to final agreement, having successfully gotten over two intermediate quarterly arrangements. The double load made the 11 months very full but very tiring and, of course, working for Uncle Sam brings in conditions that are very different from my industrial experience and at times quite frustrating. Needless to say, I am glad the job I agreed to do is finished and I am again doing the things I really enjoy." Recently Jim has been visiting a married daughter and two grandchildren in Sheboygan, Wis.

Probably all have noted in the January issue of *The Review* that B. Edwin Hutchinson, III, was recently elected as one of six life members to the M.I.T. Corporation. He already has served two terms as an alumni member and also has served as president of the Alumni Association. At present he is chairman of the finance committee of the Chrysler Corporation. We are pleased to report that Cy Young, II, has recovered nicely from a long siege of illness and is now able to play as much as 18 holes of golf. He is still in Florida and plans to work at his desk about six months of each year and spend the other six months in Florida. Even while in Florida, he attends to business mail and is in touch with his office by telephone. In three years he will be able to retire on a pension.

We have received another letter from Art Morrill, XI, from Venezuela where he is installing a water system. His letters are always interesting, particularly when they describe his experiences in foreign countries. Probably no one in the Class has contributed more to the health and welfare of humanity than has Art with his many years of sanitation work in China and now in Venezuela: "I was sorry to hear of the deaths of so many members of the Class. Although I had not seen Munoz for years, perhaps not since 1909, I remember well how jolly and friendly he was when we lived together for a time in a house on Newbury Street. I asked him how to pronounce 'El Circulo Mexicano' and he did his best to tell me, but my Yankee tongue was then entirely unable to pronounce an *r* in the middle of

a word so that it sounded like an *r* to a Mexican.

"When I wrote to you in July I guess I knew about 1 per cent of what there is to know about Spanish. By now it may be 6 or 8 per cent. I now go boldly around without a dictionary in my hand. At first I even took one every day to the restaurant where I have lunch. Now I know the meaning of most of the words on the bill of fare. When there is an unknown dish I pass it by, except on the rare occasions when I feel like gambling. I have had three or four trips to the 'litoral,' out of the temperate zone and into the tropics only an hour away. One Sunday I went with some Venezuelan friends for a swim and a fish dinner on the coast. I was there again last week, as we went on a trip to Barcelona and the airport for Caracas is down by the sea. Being December seems to make a difference as it was not uncomfortably warm. A few miles from Barcelona is Puerto La Cruz, a new oil port for eastern Venezuela, which has grown in population from 300 to 30,000 in 12 years. We were trying to figure out what could be done about the water supply, which sure needs improvement. Barcelona was founded 321 years ago but Puerto La Cruz is now the larger of the two cities. About a third of each city has piped water but a lot is sold in the streets from tank trucks at seven to 14 cents for five gallons. Three 16-inch oil pipe lines come into Puerto La Cruz, I suppose from the oil fields to the south, down toward the Orinoco River." — PAUL M. WISWALL, *Secretary*, 20216 Briarcliff Road, Detroit 21, Mich. CHESTER L. DAWES, *Review Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass. *Assistant Secretaries*: MAURICE R. SCHARFF, 366 Madison Avenue, New York 17, N.Y.; GEORGE E. WALLIS, Wenham, Mass.

• 1911 •

Following recent custom, President Don Stevens, II, aided and abetted once again by Phil Caldwell, I, Dick Gould, XI, and Harry Tisdale, V, arranged and conducted a successful class luncheon honoring "Dennie" at the M.I.T. Club of New York on January 9. There were 17 of us at the 12:30 affair, which was preceded by the usual preliminary warm-up at high noon. Fortunately our vice-president, Zeke Williams, XI, was able to attend this year and so, following a delicious meal, President Don called on the "Veep," who, as president of Erwin, Wasey and Co., one of the country's leading advertising agencies, divides his time between Manhattan, Los Angeles, and London, England. He predicted a boom year for 1952, with increasing taxes, however, keeping individual incomes down and continued prosperity depending, in his opinion, on the hoped-for changes of administration in Washington. He told us that he hopes he can slacken his business pace in the not-too-distant future, chiefly due to the fact that his son is coming along nicely in the business. Right now he is traveling a lot, working hard, and giving most of his income to Uncle Sam.

Undoubtedly the outstanding point of agreement in the interesting talk-around

which followed the Williams talk was the definite suggestion, originated at this event by Johnny Scoville, IV, that from now on we should have at least one, or possibly two, informal class get-togethers in addition to the regular five-year reunions. John is still with Sanderson and Porter in New York City and maintaining his home in West Hartford, Conn.

Royal Barton, VI, plans to be about two or three more years with Ebasco Services, Inc., and then retire to his home in Mountain Lakes, N.J. He said he and his wife very much favor intermediate get-togethers in June, as did G. Arthur Brown, X, who is enjoying immensely his work on the faculty of Pratt Institute in Brooklyn, conducting the tanning school for training men in industry, with a mid-year graduation coming up later in January. He said that Harry Tisdale had helped a lot in keeping the course up to date. Phil Caldwell, I, told us the paper box business is a tough grind at the moment, but the business is there if you work for it. He said one of his problems right now is trying to find a hobby. Jim Campbell, I, said he and Toni had one of the best times ever at our 40-year reunion and both would be delighted for an opportunity to gather with classmates and their wives at intermediate June get-togethers. He reported his consulting engineering business — Eadie, Freund and Campbell — as continuing to flourish. Lester Cushman, IV, the "royal chef" of Tech Show fame, said he was invalidated for two months last spring so that he and Hazel had to forego the reunion, but added: "Let's have 'em closer together!" Although trained as an architect, he continues as mechanical engineer with Burns and Roe, Inc., New York City. Joe Gershberg, VI, who retired from Brooklyn Edison Company in December, 1950, after 27 years of service, reported that he joined Gibbs and Hill Company, a New York firm specializing in power plant design and operation, in late January, 1951. High lights in his initial year have been the design of four power plants for Italy and two for France under the Marshall Plan, for which his particular assignment was preparing operating instructions. Many other European plants may follow, plus numerous assignments here in the United States, indicating a busy and interesting future for him.

By coincidence, the New York morning papers had that very day featured some of the 1951 accomplishments of the sanitary division of the Board of Public Works in New York City, which Dick Gould heads. Dick noted the strides made in 1951 in advancing this 100-million-dollar program for purifying the principal recreational waters around New York through new sewage treatment plants, several of which should be in operation soon. The Owl's Head Sewage Treatment Plant in Brooklyn, pictured in the papers that day, is well along, and by late January is scheduled to be partly in operation, the total cost ultimately reaching 20% million dollars. Similarly a larger project — the Hunt's Point Plant in the Bronx, estimated to cost 26 million dollars — is more than two-thirds complete and should be in partial operation this spring.

Joe Harrington, VI, still with Enjay, Inc., a Standard Oil affiliate, said he and Rose were all for more frequent mass get-togethers of the '11 family and said he has become very much engrossed in his hobby of painting, having studied art for three years at night school in New Rochelle. Dick Ranger, VIII, was another ardent advocate of the intermediate informal reunions and, for himself, reported he is busier than ever with his magnetic tape-recorder work, mostly for radio and television. Among popular programs now employing Rangertone tape-recording are "I Love Music," "See It Now," plus the Gene Autrey and Art Linkletter shows. Dick is taking up Spanish at present, largely because of the need of writing a book on tape-recording in that language. Pat Russell, II, still in real estate, said he has developed a new hobby — piano playing and the study of early-day noted musicians — along with a recently acquired love for studying sculpturing. Nat Seeley, II, amused us with the high lights of a recent sailing trip to the British Isles, which his youngest son took and which reached a climax when he attended a three-day Bach Festival in Edinboro. He reported, as we did in the last issue of class notes, on the remarkable recovery of his former roommate at school, Norman DeForest, II, from a serious early summer accident at Maitland, Fla.

President Don Stevens told us some details of what he described as his "Okonite Company Valedictory," a seven and one-half mile submarine cable which had to be transported across the continent for use in Seattle, Wash. Don's new hobby, by the way, is painting; and he does right well, too, as I found out when I was an overnight guest again at "Maison Stevens" with Lois and Don out in Ridgewood, N.J., the night preceding the luncheon. L and D also favor intermediate '11 reunions, as do Harry and Grace Tisdale. Harry suggested that it would be well to use the class notes to stimulate suggestions from others as to whether they would favor these extra gatherings of the '11 family. Harry, still active with the American Dyewood Company in New York, said that fishing continues to be his real hobby, although he has been studying conversational French recently. Another advocate of intermediate reunions was Walter Welch, VI, who reported also that he plans to retire in 1953 after 35 years with Combustion Engineering Superheater, Inc., New York City.

In his report on the "State of the Class of 1911," your Secretary gave the following distribution of the 281 active members of the Class, for whom we have good addresses: 70 in metropolitan Boston, 21 in the rest of Massachusetts, and 26 in the other five New England states, totaling 117 in the northeast area; 45 in metropolitan New York, 14 in the balance of New York State and New Jersey, and 36 in the other Atlantic Coast states, or a total of 212 on the eastern seaboard; 32 in the Midwest, 24 in the southwest and west, and 13 in territories and foreign countries.

Life's a funny proposition after all; for just as Bob Morse, VI, and his wife, Margaret, had announced the engagement of

their daughter, Peggy, to the young man (J. Putnam Brodski) we met at the never-to-be-forgotten 40th, Old Father Time comes along and says: "Hey, Bob, take it easy!" — in no uncertain terms. Invalided since late November, Bob is now showing improvement, as evidenced by the following note recently received by Don Stevens. The note read: "Thanks a lot for your letter. I have also had one from Dennie and one from Bill Hodgman, though how the latter knew I had been sick I don't know. I am really getting along fine. Downstairs every day and all day now and have been downtown a couple of times. Another month should see me back in harness, though maybe not pulling my full share of the load."

Regrets for not being able to attend the luncheon were received from Erv Young, I, who had the misfortune recently to lose his wife after a long illness; Rufe Zimmerman, IX, who once again was kept away by a directors' meeting of U.S. Steel Company; Roger Spencer, II, who formerly lived in Amityville and is now at 18 Hollywood Avenue, Massapequa, Long Island, N.Y.; and General George Kenney, I, who, unfortunately for us, was on a West Coast trip in the interests of the Arthritis and Rheumatism Foundation, which he now heads. That reminds me; Oliver Powell, XI, in a note accompanying his Christmas card from Glendale, Calif., enclosed a clipping from a late summer issue of the Los Angeles Times, containing a speaking likeness of our illustrious classmate, with the subcaption, "Appraisal — Gen. George C. Kenney, who told local audience Stalin will strike U.S. the moment he thinks he can win." Oliver has become a *ne plus ultra* California devotee despite his admission that his native New England and upper New York, where he spent many years in the shoe industry, have their own charm.

Announcement was made in the yuletide season of the engagement of Sally Quincy, daughter of Mr. and Mrs. Knight Quincy of Melrose and Ashburnham, to Stanford H. Hartshorn, Jr., '49, son of Mrs. Stanford H. (Julia) Hartshorn of Gardner, Mass. A summer wedding is planned. Miss Quincy, a laboratory technician at the Massachusetts General Hospital, Boston, received her bachelor of arts degree from Skidmore College in June. Her fiancé, a Navy veteran of World War II, after two years at M.I.T. transferred to the University of Michigan, where he received his bachelor of science degree in wood technology in 1949, and his master's degree in business administration in 1950. He is a member of S.A.E. Fraternity and recently succeeded his late father as treasurer of C. H. Hartshorn, Inc., Gardner, manufacturers of baby carriages, strollers, and living room furniture.

Sara and I once again enjoyed hugely the many Christmas cards and messages from many of you classmates. On the card from George Cumings, VI: "Am getting along as well as could be expected but still am chained down too much to suit me." A welcome note accompanied the personal Christmas card from Otilie and Paul Cushman, VI, from Oklahoma City, Okla. Paul is completing his third year as

professor of mechanical engineering at the University of Oklahoma and is also back part time with the L. and S. Bearing Company there in Oklahoma City. He is still taking a very active part in the Blue Lodge and Eastern Star. Both Paul and Otilie continue their active interest in square dancing, at which they proved so adept at our 40th.

John Scoville has just sent me a couple of clippings in reference to a recent visit by General George Kenney to Hartford, Conn., in the interests of the Arthritis and Rheumatism Foundation. In a press conference, George endorsed the views expressed recently by General Hoyt Vandenberg: that the United States is only beginning to make the investment in air power that the world situation demands. He added that Russia already has a better fighter plane than its MIG and, as good as those planes are, he added, they're on the way out and the Soviets are turning them over to the Chinese Communists as fast as their own squadrons can be equipped with this new fighter. — Like Old Man River, John Bigelow, IV, keeps rollin' along in his native city of Marlboro, Mass., where he is city engineer and in mid-January was once again re-elected secretary-treasurer of the Marlboro Chamber of Commerce. He is also secretary of the Rotary Club of Marlboro.

At this writing, Alumni Fund returns are available only through December 31st, at which point 1911 has just been passed by 1913 for the lead among the pre-Cambridge classes (1913 having 72 subscribers to our 71). If, by any chance, YOU have not sent in your pledge for this current drive, which closes in March, please act without delay. Now, in closing, how about the splendid suggestion made and remade by '11 men at the January class luncheon in New York? Please "write to Dennie," stating your views as to the possibility of having an intermediate class get-together — say at Snow Inn, Harwichport on Cape Cod, some June between now and June, 1956 (our 45th). As a tag to these notes, here are three new addresses of classmates: Ormond R. Bean, IV, 8200 S.W. 2d Avenue, Portland 1, Ore.; Edwin Pugsley, VI, 76 Everit, New Haven 11, Conn.; Arthur W. Underhill, VI, 494 Ashland Avenue, Buffalo 22, N.Y. Don't forget: Write to Dennie! — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Gardner, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

• 1912 •

A very attractive announcement card has been received announcing that Eric Kebbon is now established at 17 East 49th Street, New York, for the general practice of architecture and as a consultant in school planning and construction. Frederick A. Robinson of Weld Street, West Roxbury, Mass., in addition to being a city assessor, has taken great interest in the routing of new parkways and traffic routes through the city of Boston. He has proposed, planned, and has had sponsored by the city of Boston, an elevated highway through Chelsea, connecting the new Mystic Bridge with the Newburyport Turnpike.

Jay Pratt writes that he is finding his work as a small business specialist at the Chicago Ordinance District a very interesting assignment. About two and one-half years ago he retired on a semi-retirement basis after many years with the Electric Carbonic Company, staying on as director of finance of the Finance Committee. His job is to see that small companies are given every possible consideration in the placing of government contracts. About February first, he took on a new business as civilian assistant to the chief of the district, Colonel Robert K. Haskell, who is also an M.I.T. graduate of the Class of '29. Jay and Priscilla plan to take a month to cruise to Jamaica and the Virgin Islands early in March. He will give you full details when you see him at the reunion in June. — FREDERICK J. SHEPARD, JR., *Secretary*, 31 Chestnut Street, Boston 8, Mass. LESTER M. WHITE, *Assistant Secretary*, 4520 Lewiston Road, Niagara Falls, N.Y.

• 1913 •

Interest in our 40th reunion is very encouraging. Charlie Haglin, II, gives us a thought on the subject, worthy of Omar Khayyam: "I may be able to make June of '53. Anything is possible 18 months away." Bill Eichorn, XI: "Looking forward to reunion. Suggest we try to get a small inn or hotel where we will not be just a small part of other reunions. Ocean House was too large in my opinion, and I think I helped buy it. Learn by experience. If I can help, just ask." Henry Dew, III, from Jacksonville, Fla.: "There is no change in my situation; so I have nothing to report. Our family is well, happy, and enjoying life. Hope to make the reunion next June." Dave Stern, V: "Look forward to the 40th. Still grinding out cans at Stern Can Company (Boston). Now have four grandchildren — one granddaughter and three grandsons. Recently became president of the Jewish Memorial Hospital, Boston." Pete Haynes, I: "I look forward to seeing you in June, 1953, which as you say, is only 18 months away (hard to believe). I continue, as for many years, to help direct the destinies of Wellington and Company, members of the New York Stock Exchange at 120 Broadway, New York. I see Gene Macdonald frequently and Ralph Rankin occasionally. They are both going strong. I also had a glimpse of Charlie Edison the other day and we spoke of some of the 'old-timers.'" Fred Blackwood, VI (appraiser for Associated Factory Mutual Fire Insurance Companies, Boston): "Brevity being the soul of wit, I will only say that, God willing, I'll be there in June, 1953. Maybe we can have a contest to see who will have the most grandchildren. I have two but both are to the Nth power. Perhaps that new calculating machine at M.I.T. can compute what my credit should be. (The credit is not all mine of course)." Earle Caldwell, X: "Greetings. This is just a hasty note to get my name on your mailing list correctly. I came down here a month ago as factory manager and am living in Melrose where I have purchased a home. Very soon I will bring you up to date as to where I have been and what I have been doing the past few years. If '13

men ever get together around Boston be sure and have them let me know. It sure seems good to get back into the thick of things and I am looking forward to renewing old friendships." Bob Bonney, X: "Recently appointed director of manufacturing, Congoleum-Nairn, Inc. Was recently elected a director of American Standards Association. Hope to be present June, 1953." Louis Wright, XIV: "Just returned home after a month of Jefferson Hospital (Philadelphia). Now, after a laryngectomy, I will start to acquire a new voice. At present my conversation is limited to what I can write out on a pad I carry." I admire your spunk Louis and hope that your "acquisition" will be fast and successful. Holland Wemple, X, (sales manager, Texas Gulf Sulphur Company): "Certainly since a return envelope is enclosed with this solicitation for class funds a reply should be made. As for news, there is little that I can add except that by the time the class reunion comes about, I will have passed threescore and 10. My health, as well as my behavior, has been reasonable — at least I think so. Sometimes the latter qualification is questioned by my wife. We in the sulphur business have had a hectic and difficult time throughout 1950 and 1951, and we see no improvement in the situation for the year 1952. I have had delegations from all over the world, each asking just a little more sulphur. These are in addition to the visits from buyers on this continent. When the first curtailment of sulphur was made in 1950, the purchasing agents reported the shortage to their vice-presidents, and we had visits from that level of top brass. The presidents, not taking reports by vice-presidents or purchasing agents seriously, then made the round of calls. We never knew before that we were so popular. With additional supplies not forthcoming, the word is no longer 'popular' but must be prefixed with the notation 'un.' I hope the class notes will report something about yourself and that others may see fit to write; for, necessarily, the number must be on the downgrade or at least that is what the actuaries of our insurance companies tell us." Thank you Holland for your hope "that others may see fit to write." As for myself, I have just finished a 35-year stretch in the webbing business, and have my own small business in a small business-type industry. My organization is eager and competent to carry on in my absence, or rather absences which get longer and more frequent. Burton Cushing, II: "There is no big news as far as I am concerned. I still serve the youth of Boston as head of science at Boston Technical High School. Locally I am chairman of a committee to study zoning regulations for the town of Rockland and a trustee of the public library. Mrs. C. and I took a vacation trip through Maine and eastern Canada last August. We entertained a family Christmas party of 13 yesterday, including two granddaughters." Max Waterman, II, Vice-president of the Singer Manufacturing Company, was recently elected a trustee of the Bridgeport, Conn., People's Savings Bank. Patient and prolific Lester Hoyt, V, writes, from East

Aurora, N.Y.: "Still on the Niagara frontier, after 24 years with Larkin Company, Inc., followed by 14 years at National Aniline. That 40th reunion sounds intriguing! I have a tentative trip to the West Coast scheduled for 1953 but if time permits I'll try to attend that reunion. After having educated and married off three daughters, the Hoyts finally got around to building a home in 1950 on the lot they had owned for 25 years. The new home has proven very enjoyable. As to grandchildren, the score is now nine, ranging in age from six years to six weeks; six grandsons and three granddaughters, including a pair of twins. Only two of them are nearby, in Rochester, N.Y. The others (three in Andover, Mass., and four in Wenatchee, Wash.) we rarely see." Lester included pictures of his new house. It is very attractive, on a 125- by 230-foot lot, overlooks an iris garden of over 100 varieties, and has two fireplaces to warm all nine grandchildren. I welcome the return of a contributor with picturesque writing style. Years of sloshing around in a tannery is not conducive to elegance, of which he has everything else, but Dave Nason, XIV: "I have your abusive, fatuous scribbling dated the third. If its purpose was to provoke a reply, you are an able solicitor. Where did you get the idea that I am occupied with the art of simulating mink? Nothing could be further from the truth. A mink is a nasty animal belonging to the rat family and its use in the fur trade is essentially for ostentatious purposes. . . . My product, Fred, simulates the fur of noble animals, the industrious beaver and the intelligent seal. . . . You can count on me as usual at the next reunion wherever it may be held. Hereon our Class should be more concerned with the pursuit of happiness and less with the pursuit of wealth. Happiness, of course, is a reward and not a tangible object to pursue. It is not something you want and receive but rather a bonus that comes from correct thinking and action. Whether I make myself clear or not, sit down and write a check payable to the Alumni Fund and you will get a chunk of happiness when you mail it in. Fred, I trust you will put in an artistic plug to help Larry Hart with the Alumni Fund. Our class record is not good, which unfortunately we must recognize if we are to improve it."

I am indebted to Mrs. Wylie Daniels, for the following: "Wylie J. Daniels [XI], 63 years old, retired Secretary-Treasurer of the Indianapolis Union [Belt] Railway Company, died at his home, 1843 North Pennsylvania Street, Indianapolis, Ind., October 3, 1951. He suffered a stroke in 1939, but was able after some months to resume his work. In 1943 he retired, having completed 30 years of service with the Belt Railroad. From 1945 he was bedfast; but his friends who visited him regularly testified he did not lose his sense of humor or his gallant spirit. To express his fascination in the development of railroads he wrote *The Village at the End of the Road*, a history of the first Hoosier railroad, running between Indianapolis and Madison, and its growth into the Pennsylvania Railroad. Copies of his work, which is constantly used as an authority

on the subject, are in many state, historical, and university libraries in the United States and in the *Annales d'Histoire Sociale*, Paris. Copies of the edition were exhausted. Mr. Daniels, Beta Theta Pi at Wabash College, was elected to Phi Beta Kappa in his junior year and graduated in 1910. During his graduate work at Technology, he was for one year an instructor and graduated with a degree in Mechanical Engineering. Mr. Daniels' father was Edward Daniels, a noted Indianapolis lawyer; his maternal grandfather, William Wylie Johnston, was a pioneer Indianapolis merchant. A lifelong resident of Indianapolis, Mr. Daniels was a member of the First Presbyterian Church and served for years on its board of trustees. He was also a member of the Indianapolis Literary Club, Indiana Historical Society, and a past member of Woodstock Club, Progressive Club, and Dramatic Club. Survivors are his widow, Mrs. Margaret Speed Daniels; his brother, Joseph J. Daniels, a lawyer; a niece, Katherine Daniels; an uncle, Parke Daniels, of Starkville, Miss.; and an aunt, Mary D. Johnston, Los Angeles, Calif." Wylie's pastor, George Frantz, paid him this supreme tribute: "Wylie Daniels was a great man, and he never even suspected it. That is why he was a great man. Perhaps no truly great man is ever aware of his greatness, because the truly great are humble." — FREDERICK D. MURDOCK, Secretary, Murdock Webbing Company, Box 788, Pawtucket, R.I.

• 1914 •

Classmates will undoubtedly recall that, because of ill health about two years ago, Jim Reber, Vice-president of the Columbian Rope Company of Auburn, N.Y., stepped down from the very active position he then held in the company. He is now back in action again, but at New Orleans. The Edwin H. Fidler Company is the oldest cordage company in the United States, and is a wholly-owned subsidiary of Columbian Rope. The company decided to build a new large plant at New Orleans. Jim selected a 10-acre site there and has the responsibility of designing, building, and putting the new unit into operation. He is temporarily making his home in New Orleans, but expects to return to Auburn by 1953.

Our hardware specialist, Duncan Shaw, has again appeared as president of a builders' hardware manufacturing company. It is the Arrow Lock Corporation of Brooklyn, New York. Dunc sent along to your Secretary a clipping from the *New York Journal American* listing some of the men of the year who had come into prominence during 1951. Listed was our classmate Frank J. Jerome, who became executive vice-president, the No. 2 spot of the New York Central Railroad. These notes previously carried this announcement in detail a few months ago.

Turpin Hsi is back in the United States and is located at Scarsdale, N.Y. It is hoped to have more information regarding Hsi shortly, and those who attend the '14 dinners in New York will look forward with great pleasure to seeing him again.

The host of friends of Dinny Chatfield will be sorry to learn that his wife, the former Grace Scofield, whom he married on November 10, 1920, died at Hartford, Conn., on December 31. Chat is secretary of the United Aircraft Company at East Hartford. Another of our air-minded classmates is Harold Coleman. He has recently joined the Georgia Division of Lockheed Aircraft as training co-ordinator for the manufacturing methods division.

One of our most enthusiastic baseball players of undergraduate days, Arthur S. Page, died suddenly on January 11 at his home in Newbury, Mass. Although a civil engineer and formerly with the Massachusetts State Highway Department, then later with the Engineering Department of the Boston and Maine Railroad, Page, for many years, has had his own real estate and insurance business in Newburyport, Mass., where he was known as "Page — The Insurance Man." He was very active in local affairs, including membership on the town finance committee, his church parish committee, board of directors of the Y.M.C.A., and several other local organizations. Page was also a past Eminent Commander of the Newburyport Commandery of Knights Templar and a member of Aleppo Shrine. At the Institute he was a member of Theta Chi. Page's first wife, whom he married on May 2, 1917, died in 1921. He later remarried, and his second wife, a son, and two daughters survive him. — H. B. RICHMOND, Secretary, 275 Massachusetts Avenue, Cambridge 39, Mass. Ross H. DICKSON, Assistant Secretary, 126 Morris-town Road, Elizabeth, N.J.

• 1915 •

So, you see what happens when you don't "help Azel" — no class notes last month! "Let your lights so shine" and give! Write something about yourselves when you send in your class dues check. The dues are not much and not often, just enough to keep the Class solvent.

More class weddings, and all our best to these young couples for a long, healthy, and happy life. On December 12, in Waterbury, Conn., Orton and Mrs. Camp's daughter Miriam was married to Dr. James C. Niederman. On December 8, in the First Universalist Church, Wasau, Wis., Allen and Mrs. Abrams' daughter, Jean Chilton, was married to Lieutenant (jg) Henry Langdon Smith, of Macon, Ga. We had met Jean while she was here in Boston. Here's an interesting letter from Allen: "Walter Gale '29 visited with our Milwaukee group on December 13, and we had a very good discussion on means for interesting prospective M.I.T. students. Out of this came some ideas which I am sure will be useful not only in the Wisconsin area but also in other states. I had a talk on the telephone the other day with Ken King, who, as you know, retired from Du Pont some time ago and is now spending his time traveling to Hawaii, Florida, and such points — all of which sounds pretty good to the people undergoing temperatures of 20 degrees below zero! Mrs. Abrams and I took a quick two months' visit to the Scandinavian countries, England, and Europe this summer.

One of our most interesting visits was that with Welles Bosworth '89, whom you may remember as the architect for the M.I.T. buildings. He is a long-time family friend so that we enjoyed very much the hospitality of his villa which he built outside Paris at the time he went over to assist in rebuilding the Rheims Cathedral and other landmarks ruined by the Germans in World War I. Through him we were able to have Jim Killian '26 entertained by a Paris group when Jim visited there this last summer. The attached clipping on our daughter's wedding will interest you, since you knew the young lady. Here are best wishes to you and yours and the other classmates of 1915."

Charlie Blodgett has been in Aboshi-Ku-Himeji City, Japan, and we hope to have a letter from him soon for the notes. Alejandro Bibolini has written from Asuncion, Paraguay, about the M.I.T. glasses we sold for the Class. Long time no hear from him in this distant land so we hope he will write something about himself. Clive Lacy and his able committee are soon going into action on their plan for our capital gift to M.I.T. on our 50th reunion. They deserve all the support the Class can give for this worthy project.

Even semiretired Sam Berke keeps busy on his Deep Lake Farm, Lakeville, Conn., up in the Berkshires. Read what he does: "We are all well and I am afraid that farming is now our principal occupation. It is a busy life and leaves very little time for other things. Our trips to New York and Boston have become less and less—just once or twice a year and then only for a day or two to take care of musts like seeing the dentist and signing all sorts of legal documents. When city people go in for farming, the local people have them pretty well classified—the one-year farmers, the three-year farmers, the seven-year farmers, and the permanent ones. We have just hurdled the last class and it looks like we are in it for good. We like it more each year and we are anxious for you to stop by next summer and see it at its best. Running a farm is like eating coffee and doughnuts: Every time we get some more land, we buy more cows to eat the crops and then we build more barns to hold the cows, then more tenant houses to hold the men, and then we need more land to come out even and we seem to be in a state of imbalance all the time; but it is very fascinating. We are now farming 700 acres. This gives us crops for about 180 head of purebred Guernseys and we now have about 25 buildings on the place and are in the midst of building several more. There is no end to local activity. I am on the board of two local schools and several local industries and this keeps me pretty busy. I wouldn't go back to city life for anything. The people here are wonderful and we were very lucky to make this move when we did."

Many Christmas cards from classmates all over the country warmed our hearts with a good feeling for these fine old friends. Long-distance honors go to Avice and Hen Berg from San Francisco. Tower Piza's card was a picture of a tired old Santa slumped sleeping in a big chair with

many little gremlins running around him busily making toys. Tower humorously describes the picture: "This is the way Grandpa Azel is going to look when he finally grows that long-expected beard. The little fellows are his gay young classmates of 1915." The one consolation in this is that we're all getting older together, so who'll be left young to run around? Gene and Ruth Place have moved to the West Coast and are temporarily living at Hotel Green, Pasadena 17, Calif., until they can locate permanently. Gene was feeling greatly improved when they left here at the end of November and we all wish him continued and improving good health out there. "Help, help"—these notes depend on you.—AZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline 46, Mass.

• 1916 •

We would like very much to report with pleasure that we received Christmas or New Year cards from the following: Hal Neilson, Steve Whitney, Vert Young, Izzy Richmond, Bill Drummey, Bill Barrett, and one from Wes Blank with this note: "I will give you some more information on a couple of classmates here, and so on, in a future letter. We had a fine M.I.T.—Washington, D.C., annual dinner last week and met and heard Putnam '17 (also of M.I.T. and from Springfield) who is the new price controller. We (my wife and I) are going to Chattanooga, Tenn., to spend the holiday with my daughter and her rebel husband, a University of Tennessee boy. My son is supervising a West Virginia airport job as project engineer."

We were glad to have the following word from Carl Carstens in Torrance, Calif.: "In 1941 I started a conversion job from engineering to accounting and have devoted all my time to the latter, starting in 1943. At present I am a certified public accountant associated with the firm of Parker and Parker, Los Angeles, who specialize in Federal and state tax matters."

Were you watching television on January 14 at 8:30 P.M. in New York, on Station WABD (Channel 5)? If so, you undoubtedly saw Maurice Strieby on the Johns Hopkins Science Review program. Maurice is director of technical demonstrations of the American Telephone and Telegraph Company. This program was carried over a network of 17 stations and presented a condensed version of the lecture he has given before a number of professional societies—on coaxial cable and radio relay, including a demonstration of transmission over a light beam and over microwaves. In line with this, we recently received a newspaper clipping from the *Denver Post* in Colorado, carrying an account of one of Maurice's speaking engagements, which we feel will be of interest to you: "Television is to the telephone company what oranges are to the Union Pacific railroad, Dr. Maurice E. Strieby, director of technical demonstrations for the American Telephone and Telegraph Company told the Denver Sertoma Club Thursday noon. "The railroad doesn't grow oranges, and we don't produce television programs. Our business is transporting this highly perish-

able product across country and delivering it to customers in the best possible condition. I'm happy to say we have nothing to do with its subject matter," the speaker said. While slated to talk to the Denver luncheon club on television, Dr. Strieby covered the entire communications field of wire, coaxial cable and the new microwave radio relay system which makes transcontinental television possible. . . . Had the speaker used a live television screen he couldn't have gained more audience interest than he did with his electronic tic-tac-toe machine, used to demonstrate the near-human intelligence of automatic switching devices. Push a button on any of the nine squares of Dr. Strieby's tic-tac-toe machine and an 'X' lights up in that square. Then, automatically, the machine makes an 'O' in a nearby square—just as in the old, familiar scratch paper game. The machine never makes a mistake. The best a human opponent can do is tie it, so neither side scores three in a row. But make one false move and the machine pounces on you without mercy, flashes three goose-eggs in line and makes a noise remarkably like the traditional 'raspberry.' 'Automatic switching makes dial phones possible,' said Dr. Strieby. 'If human operators still carried the load, by 1960 there wouldn't be enough women in the United States between the ages of 18 and 60 to handle all the calls we'll be getting at that time.'" Sounds very interesting. Maybe Maurice will give us a demonstration of the ticktacktoe machine at the next reunion.

Bill Farthing wrote: "The trip to Mexico was reasonably successful. Had lots of fun: good chases with the dogs, killed a bear. Myra and I are leaving a week from today for Sea Island, Ga., for a couple of weeks just to kill time and be away for the holidays." We received this letter from Earl Mellen: "I am sorry that I missed out on the reunion and don't know that there is anything particularly important to write about in order to bring you up to date. My family has grown up in the last several years: My four boys have married and I have two grandchildren, with a third on the way. The Mellen family has, therefore, been reduced to the two daughters of 15 and 17, which seems a small household compared to what it was. About the only M.I.T. personnel I have bumped into in recent months have been Bob Wilson at N.A.M. Board meetings and Joe Barker at the N.A.M. Congress of Industry."

Pete Mahlman sent us this letter: "I would very much have liked to attend the 35th reunion but I had been invited to motor to Mexico with my daughter and son-in-law, starting June 9th, and my wife and I just couldn't pass up such a chance. It was a wonderful trip. We both enjoyed it very much, although I must say that we sweltered some going across the King ranch. We had New Orleans on our route and had to pass through the torrid zone to get to Brownsville. I am still plugging away as a patent attorney at the Carborundum Company; have just about eight years to go before I retire. I believe I previously reported that I have three healthy grandsons, including a pair of

twins, presented by my daughter. Since then my son has acquired a very dear little girl. Did I previously report that he got his Sc.D. in Physics at M.I.T. in June of 1948? What a man!"

We were very pleased to hear from Harold Saunders, who wrote: "I have little to add, I fear, to your class notes in *The Technology Review* except to say that I am continuing to serve, as a sort of side line, as chairman of the Advisory Committee on Antarctic Names for the U.S. Board on Geographic Names. I don't get around too much these days but this takes me mentally, about once a week, many thousands of miles away!" Here's a short one from Joe Brodil: "Relative to my latest activities, wish there were some that could be commented upon. Unfortunately, my daily life is quite uneventful and rather barren of interest. Any comments therefore would be merely a repetition of past letters." Bet it isn't half as "quiet" as it sounds, Joe. Keep writing.

John Gore came through with this one: "I will start the New Year right by dropping you a line. It must be a thankless job to try to get material for the column month after month and year after year. I doubt if many of the members really appreciate what you do. I didn't until I just started to think about it and began to realize what a job it must be to dig up information out of your old classmates. So much for that. I was really sorry to miss the last reunion and had definitely planned to go. There is nothing much new here. I am still with the Beech-Nut Packing Company and have been there now over 31 years. My, how the time does fly! We are really getting old! I used to look forward to the things I would do 'later in life'—the books I would read especially. I am now beginning to realize that that time may never come. It is already later than we think or rather later than we realize. However, in this generation they have set up facilities for retiring, so it may work out as Robert Browning says: 'Grow old along with me. The best is yet to be. The last of life for which the first was made.' I have been interested in Boy Scouts for a good many years, having a son of my own and believing that this is a good way to help fill a real need and at the same time serve my country by helping to train its youth in the principles of freedom and democracy. I have been president of my council now for the past four years and am booked for a fifth. I have a grandson about two years and two months old who looks like me and seems to take after me in more ways than one!" In reference to a few of your comments relative to the duties of your Class Secretaries, we would be inclined to agree with you if it weren't for the fact that our classmates have co-operated with us wonderfully in getting material to us for the column. There have been a few instances which have prompted us to wonder which way we could turn to get material for the column, but always someone has come through to fill the gap. The beauty of it is that it isn't the same few all the time; rather it has been an almost 100 per cent effort on the part of the classmates that has been pulling us through month after month and year after year.

Here's a letter from Ed Weissbach: "I was sorry to miss the 35th, but I did tell Jimmie Evans at the Victory Dinner in New York that my nephew was graduating from the Episcopal Seminary and that I would probably be expected to attend his ordination—which I did. This boy was the same age as our daughter so has always been very close to me. Said daughter was married last year to Harry M. Oberholtzer of Glenside, Pa., who is a student at the moment at Ursinus College. Arvin Page dropped us a card after the reunion and said he had stopped at a motel on his way back home, and, as the motel is almost in our back yard, we were disappointed that we did not see him. This past summer we took an escorted Union Pacific tour to Yellowstone, Salt Lake, Denver, Rocky Mountain National Park, Colorado Springs, and to Pike's Peak. Always loathed anything like regimentation and preferred driving to trains, but we were delighted with everything about the trip: the arrangements, freedom from worry about reservations, and especially that long five-day drive through Ohio, Indiana, Illinois, Iowa, and Nebraska. At Grand Lake Lodge we were met by Agnes' nephew, Herbert S. Bridge. He took his Ph.D. at M.I.T. in 1950 and is working on the nuclear physics project on Mt. Evans. It seems that he and his family are great friends with Chuck Loomis' son who is engaged in the same activity. When I saw Chuck's grandchildren, it made me realize that we are getting to be the older generation in a far greater way than the call for the 35th reunion did. The M.I.T. Club of Philadelphia has been having the first meeting and dinner at the Campbell Soup Company cafeteria for the past few years, thanks to Mr. McGowen, and I get to see more men than at the other meetings. Usually Ed Whiting comes; also Obie Pyle. Fred Spencer (Sutermeister) is a neighbor at the R.C.A. Victor plant in Camden so we meet once in a while on the street. For a time we got together for lunch weekly but with all the defense work that they are doing the meetings took too much time. I hear from Spencer Hopkins every once in a while. His daughter graduated from Sweet Briar last year and was married shortly after. Spencer has moved to Orchard Ridge Road, Bloomfield Hills, Mich. That ought to make him almost a neighbor of Cy Guething. Had a card recently from Flipp Fleming saying that he and Margaret were on a vacation trip to the Southwest and to Mexico. They had a visit with their son who is married and settled in Texas, I think in Dallas. I gave up plant work about three years ago when I was appointed a mechanical engineer at Campbell's. My outside activities now are centered in the quick freezer stations that we have in Delaware, Pennsylvania, and Maryland. I don't have the labor problems to contend with that I formerly had, so life may last longer. Now that our daughter is away we seem to be raising dogs, and have transferred our loyalty from Doberman pinschers to Dachshunds, and the one specimen we own seems to keep the house lively. My outside-of-work activities are chiefly my job as clerk of the

vestry of Grace Church, Merchantville, where I have been on the vestry for 15 years; also learned that Jimmie Evans was a vestryman. The new Delaware River Bridge is 30 miles south of us and the New Jersey Turnpike passes about three miles east of us, so if you pass through be sure to give me a call."

Phil Baker had originally indicated that he would be at the reunion. When he didn't make it, we tried to bring a little of the reunion to him by sending him a picture of the group at the 35th reunion. Here are his comments: "Time is relentless in its artistry, and we ever seek in the faces the collegiate youth we knew. Attending conventions gives a new impetus to the association. My impression from this fine picture is that full maturity has overtaken us all. Everyone has a very happy expression." Herb Gilkey dropped us a line. Everything is going well with him. We also received a short note from Willard Brown indicating that he is fine.

The warm weather will soon be with us, and with it will come the preparations that go with the experience of having another reunion. Shortly after this column reaches you, we hope to embark on a full-scale mailing program which will give you all the details on the when, where, how to get there, what to expect, and so on, of this reunion which is being held because of the popular demand of the classmates. Those of you who have attended past reunions know just how much fun they can be. Those who haven't had the opportunity to attend should take advantage of this opportunity to "get your feet wet." Best wishes to all "Sixteeners." Keep the letters coming.—RALPH A. FLETCHER, Secretary, Post Office Box 71, West Chelmsford, Mass. HAROLD F. DODGE, Assistant Secretary, Bell Telephone Laboratories, Inc., 463 West Street, New York 14, N.Y.

• 1917 •

Lucius T. Hill is now president of the Grand National Curling Club of America and planned a trip to Scotland early in January as a member of the Country Club Team. He still retains his presidency of the Class of 1924 of M.I.T. Rad Stevens, who is president of the Elgin Manufacturing Company in Elgin, Ill., was elected president of the Packaging Machinery Manufacturers Institute. Rad writes he has been having a rough time this winter with three operations, but believes that it will put him in good shape for the 30th reunion. Kingsley Gillespie has been elected to the board of directors of the Connecticut Power Company. He is president, treasurer, and director of Gillespie Brothers, Inc., publishers of the Stamford, Conn., *Advocate*.

Correction and Amplification Note: Duncan MacRae writes us: "Recently your class news mentioned one of our classmates as the only one who had a son on the teaching staff at M.I.T. If you will look at *The Tech* for Friday, November 2d, 1951, you will see the following headline: 'Course 7.01 has Biology's First Woman Lecturer.' If you will read further below, you will see that Dr. Edith J. Krugelis is, in private life, Mrs. Duncan MacRae, Jr., and that he is in the Depart-

ment of Social Relations at Harvard. So perhaps I am the only member who can claim the distinction of having a daughter on the Faculty of M.I.T."

Heine Gartner's Cambridge business, the Boston Metal Clad Door Company, burned out completely last fall. Heine says, however, that he is not too much disturbed since for some time he has been thinking of going down to the Cape and making antique furniture.

As this is being written, plans are being made for a group get-together prior to the Boston midwinter alumni meeting. Win Swain is bringing a number of stereoscopic pictures taken at the dinner at the Hotel Continental last fall when pre-reunion plans were being made. Lobby has arranged with the management of the 100 Memorial Drive apartment house for use of the Penthouse Room for the occasion — **RAYMOND STEVENS, Secretary**, Arthur D. Little, Inc., 30 Memorial Drive, Cambridge 42, Mass. **FREDERICK BERNARD, Assistant Secretary**, 24 Federal Street, Boston 10, Mass.

• 1918 •

As I write this, winter grips the cold countryside, and reminds us that our own Class is approaching harvest. More of us have passed through the portal which admits to "where." Only last month the notes contained a portion of a letter from Bunny Pinkham written in mid-summer. Since then, and as a result of the February notes (written in December), word has reached me that Bunny died last September 9th. There is no further information to report as to the cause of his death, or what family survives him. Only the one stark fact, transmitted indirectly from his business office, the Lehon Company of Chicago. And there are other reminders of faces which will not be seen again, as well as of years that will not come again. George Davis, for 20 years in charge of the Chicago office of the North American Manufacturing Company of Cleveland, died on November 29.

Remember Sibyl Walker? Of course you do. She was the beautiful co-ed from Salt Lake City who took Geology, was class secretary freshman year, on the *Technique* Electoral Committee sophomore year, and treasurer of Cleofan as a junior. She had a far-away look in her eye, especially while working on her thesis: "A Study of the Ores of Broken Hill, New South Wales." There were never too many co-eds who briskly produced a change of heartbeat as they entered the classroom or who demonstrated the timeless power of the truly feminine. Sibyl was one of them. She died at the Hotel Utah in Salt Lake City on December 7. — **GRETCHEN A. PALMER, Secretary**. The Thomas School, The Wilson Road, Rowayton, Conn.

• 1919 •

Dr. Marshall C. Balfour sent the following note: "Since the Secretary is so faithful and efficient, I should contribute a bit of news occasionally. I have had headquarters in New York since 1949 and live in pleasant and ideal surroundings (67 acres) at Kent, Conn. Both daughters are married and we welcomed the first grand-

son last May. Recently, I became an assistant director of the Division of Medicine and Public Health of the Rockefeller Foundation. My special interest is new population studies. Early this year I'll make a trip to Japan and other parts of the Far East." Your Secretary ran into Bal on the street in New York recently, and he looks just as young and peppy as ever.

A recent card from S. Albert Kaufman of North Wilmington, Mass., advises that he is still occupied with his 27-year-old professional land-surveying practice. Congratulations to Don Kitchin on his 25 years in research with the Simplex Wire and Cable Company. He gave a paper at the microbiologist sessions of the American Association for the Advancement of Science, the conference having been held in July at New Hampton, N.H. Another paper was presented by him at the National Research Council in October at Washington, D. C. He was elected vice-chairman of the Insulation Committee of the National Research Council. As to his "progressing" family, he writes: "We have a new grandson (born December 21, 1950), David Alan Kitchin, our oldest son's baby boy, and they reside in Pittsfield, Mass. Don, Jr., is assistant to the chief engineer of the May Engineering Company. Charles has one boy, aged four, and is now assistant professor of modern languages and head of the Student Union as faculty adviser at Northeastern University. Bob is a certified public accountant with the Patterson, Leele and Dennis Company in Boston. He has a boy, Bobby, Jr., aged five, and a girl, Nancy, aged two."

In 1946, R. B. MacMullin established his own firm known as the R. B. MacMullin Associates, comprised of consulting engineers serving the chemical, electrochemical, and various process industries. His firm is located at 610 Hancock Building, Niagara Falls, N.Y. A recent bulletin had this to say of our classmate: "Mac, alias the Old Man, runs the show, shares the profits (as well as the tough assignments) with the Associates. After 25 years with Mathieson Alkali Works, the yen to be 'on his own' got him." The Class wishes him continued success.

Ervin M. Kenison is nearing 10 years of service with the Federal Power Commission in Washington. He is now working on a special assignment with the Air Force for an extended period. He hopes to join us all for the "1954 reunion." — **EUGENE R. SMOLEY, Secretary**, The Lummus Company, 385 Madison Avenue, New York 17, N.Y.

• 1920 •

The turn of the year did not produce any evidence that the members of the Class of 1920 resolved to turn over a new leaf and provide their aging Secretary with news of their whereabouts and activities. This seems a pity because I am sure that some of us would like to read such news if it became available.

Old faithful K. B. White remembered to send his always interesting and artistic Christmas card from 1300 Manhattan Avenue, Union City, N.J., and from 1 Villa Jocelyn, Paris. Ed Rich has left New

York City and is now in Wellfleet, Mass. Clara McWhirk has left Douglas, Ariz., and is in Warrensburg, Mo. Bedros Kemkian is now in Los Angeles; address 342 North Windsor Road, Enoch Doble is another Cape Codder but has moved from Wellfleet to Sandwich.

Before long I expect to have added evidence that the Class of 1920 will continue to shine as one of the most illustrious of all classes, but for the present that information is still confidential. All I can say is, keep an eye on these columns and while you're about it, contribute to them. — **HAROLD BUGBEE, Secretary**, 7 Dartmouth Street, Winchester, Mass.

• 1921 •

Walter J. Hamburger, Director of the Fabric Research Laboratories, Inc., of Boston, and visiting professor at Lowell Textile Institute, was awarded an honorary master of science degree at a convocation at the Lowell Institute last December at which Secretary of Commerce Sawyer and four prominent textile authorities received the honor. After receiving his bachelor's degree, Walter returned to the Institute and was one of Technology's first graduates of the Course in Textile Technology, in which he obtained his master's degree in 1941. He earned his doctorate at Brooklyn Polytechnic in 1949. He is widely known as a consultant and lecturer. Irving D. Jakobson, President of the Jakobson Shipyard, Inc., Oyster Bay, N.Y., addressed the National Motorboat Safety Conference during the motorboat show in New York. Irv's subject was "The Relation of Safety to Boat Yard Operations." Roger Clapp, who joined us at Alumni Day three years ago, writes from Tampa, Fla.: "I have been here for the last two summers and winters although I hope to get north next summer and be able to see the Class at commencement time. I have been passing time doing some boating and fishing and enjoying the mild climate down here."

Harold N. Ewertz, sales engineer for the Graham Manufacturing Corporation of Ferndale, Mich., has moved from York, Pa., and is a near neighbor of ours at 12 Marshall Street, Irvington 11, N.J. New addresses have been received for Samuel F. Chalfin and Rear Admiral Homer N. Wallin. Edgar E. Hume, a major general and president general of the Society of the Cincinnati, installed British Prime Minister Winston Churchill as a member of the society at ceremonies in Washington in January. Ray St. Laurent writes that on a recent trip from the Manchester, Conn., headquarters of the Rogers Corporation, he talked to Joe Gartland and Bill Loesch in Cleveland. Bill advised that Squeeze Huggins is with Seymour Colton's organization in Cleveland, the Colton Chemical Company. In Chicago, Ray talked with Howard F. MacMillin, President of the MacMillin Engineering Corporation, engaged in special work on hydraulic presses and pumps. Ray has pointed out that we inadvertently omitted the name of Buzz Burroughs '20 from the list of those attending the reunion, although the November notes did refer to his winning one of the golf prizes. The team of Buzz and Larry

Davis'22 has attended all of our five-year celebrations and the latchstring will continue to hang outside for them as it does for all who want to have a good time with a live-wire group, unfettered by delusions as to quantity, quality, or class designations.

Joseph W. Gartland, research engineer, Union Carbide and Carbon Company, Cleveland, writes that he saw Bill Sherry at the Chicago meeting of the American Petroleum Institute. Joe sent a clipping from the *Cleveland Plain Dealer* on the Colton Chemical Company's expansion in manufacturing and the work of its subsidiaries, Merritt Products Company in bookbinding glues and padding cements, and the Cosma Testing Laboratories. President H. Seymour Colton has spent the last 10 years developing these enterprises following five years as a consultant and 15 years with Du Pont and the New Jersey Zinc Company. Babe will be remembered for his swimming prowess in our undergraduate days. His son, Gary, was graduated from Technology in 1949 and Evan is in the Class of '54. Sons of members of the Class now attending Technology include two freshmen, Stanley H. Barriger, son of John W. Barriger, 3d, President of the Chicago, Indianapolis and Louisville Railroad; and Myles J. Kiley, son of Albert J. Kiley, chief engineer and a director of James A. Kiley Company, Somerville, Mass. Other sons of classmates now at the Institute include the following (fathers' names in parentheses): Evan T. Colton'54 (H. Seymour Colton), Allen L. Cudworth, G. (James R. Cudworth), Herbert C. DeStaebler, Jr., G. (Herbert C. DeStaebler), Edward C. Facey'52 (the late John A. Facey), Peter Felsenthal'54 (Robert M. Felsenthal), Richard F. Jenny'52 (Melvin R. Jenney), Nelson C. Lees'53 (Mrs. Cornelia Nelson Lees), Robert M. Lurie'52 (the late Joseph Lurie), Decker G. McAllister, Jr., '54 (Decker G. McAllister), John B. Mattson, Jr., '52, and Melvin R. Mattson '54 (John B. Mattson), Robert D. Moore, Jr., '54 (Robert D. Moore), Arthur H. Schein'52 (Sumner Schein).

Lawrence B. Richardson, a retired rear admiral, has been elected senior vice-president and a director of the Electric Boat Company and a director of the subsidiary, Canadair Limited of Montreal, the largest aircraft manufacturer in Canada. An Annapolis graduate, he received the master's degree in Course XIII-A with us. He retired from the Navy in 1946 to become variously director of research and development, president, and chief administrative officer of Fairchild Engine and Aircraft Corporation. President of the Institute of Aeronautical Sciences, he will make his headquarters in Washington, D.C., and Montreal. Andrew I. McKee, a retired rear admiral, has been appointed a trustee of the L. Y. Spear Foundation, established to present an annual award to the honor man of each class of the Submarine Base Officers' School. Director of Design of the Electric Boat Company and an Annapolis graduate, he received the master's degree with us in Course XIII-A and served the Navy in design and construction until his retirement in 1947. His sons attended Technology—Andrew I.

McKee, Jr., '42, and Francis B. McKee'51. Eugene S. Clark is chief of the Sanitary Engineering Laboratories, State Department of Public Health, Springfield, Ill. He is a former officer and member of the Society of Illinois Bacteriologists, the American Public Health Association, and the Society of American Bacteriologists. A scoutmaster and moderator of the First Congregational Church of Springfield, he says beekeeping is his principal hobby. The Clarks have three daughters: Louise, Monmouth'43; Marybeth, Washington University'51; and Patricia, a registered nurse at Michael Reese Hospital, Chicago. We acknowledge many holiday greetings, among them those from the Max Burcketts, Jeff Farmers'22, Harry Fields, Joe Gartlands, Dug Jacksons, Jack Kendalls, Chick Kurths, Moose LeFevre, Bob Millers, Gus Munnings'22, Helier and Graciela Rodriguez, Ray St. Laurents, Lem Tremaines'23, and Carlton Tuckers'18.

We have the following details of the passing of Russell Carl Johnson, reported last month. Since 1949 general manager of the Northern Peru Mining and Smelting Company of Lima, Peru, Russ was on a business trip to New York when he died there on December 3, 1951. Born in Quincy, Mass., May 19, 1900, he prepared for Technology at Quincy High School. At the Institute, he was a member of the Mining Engineering Society, and, successively, its secretary and president. He was graduated in Course III and became an engineer with the Tennessee Copper Company. He was married to Esther V. Bagg, Radcliffe'22, in 1923 and joined the American Smelting and Refining Company in Mexico. Until his transfer to the Peruvian subsidiary in 1949, he held various positions, including those of general superintendent of both the Santa Eulalia and Parral companies. A member of the American Institute of Mining and Metallurgical Engineers and several clubs in Peru, he is survived by his wife; his mother, Mrs. Selma Johnson; a son, Stanley, Harvard'49, a mining engineer in Mexico; a daughter, Mrs. Carol Oakes, Radcliffe'50, of Wood River, Ill.; a son, Philip, attending Governor Dummer Academy, Byfield, Mass.; a brother, Harold, of Belmont, Mass.; and a sister, Mrs. Ruth Lanthier of New Jersey. On behalf of the Class, sincerest sympathy is extended to the family.—CAROLE A. CLARKE, *Secretary*, International Standard Trading Corporation, 67 Broad Street, New York 4, N.Y.

• 1922 •

By the time these notes are published, we will be only three months from our 30th reunion, which will be held this year at the Sheldon House, Pine Orchard, Conn. The capacity of the Sheldon House is limited, and the committee has therefore requested that early reservations be made so that there will be no last minute disappointments. We further understand from the committee that there will be no attempt to promote this reunion unduly. The facilities will be available, the time and cost will be known, and those who have enjoyed the pleasures of our past reunions will be on hand again without further urging.

Oscar Horovitz continues active with his movie camera. He has again won an award from the American Cinema League for his 1951 picture, taken in Venice in the course of his trip to Israel, entitled "Venezia, Pearl of the Adriatic." Oscar also took films in Israel and other countries. One of his sound pictures, "Passport to Life," deals with Youth Aliyah and immigration in Israel. This film now being shown to chapters of Hadassah all over the United States. Another film is made in Israel shows the Haifa Institute of Technology. This picture will be shown in all English-speaking countries of the world.

Dale Spoor, having completed his stint in Washington for Mr. Wilson, is now back in Bronxville at his old address, 12 Meadow Avenue. Gus Munning's daughter, Jeanne Lucille, was married last November to Cornelius Luehs, Jr., of Newark. Mrs. Luehs is a graduate of Ells College, class of '49. Her husband, a World War II veteran, attended Rutgers University and is in business in New York. Milton Manshel was married last November to Mrs. Ruth Zirn Starobin, daughter of Mr. and Mrs. Harry Zirn of the Hotel St. George, Brooklyn. Mrs. Manshel is the widow of Mort Starobin, who died in 1942. Mr. Manshel's former wife, Mrs. Ruth Berkowitz Manshel, died in 1949. The Manshels are living at 36 Dartmouth Road, West Orange, N.J.

Oscar Horovitz, as President of and on behalf of the Boston Stein Club, presented to the Institute a gift of \$40,000 at a meeting at the Hotel Statler last fall on October 17. Frederick S. Blackall, Jr., President of the Taft-Peirce Manufacturing Company, Woonsocket, R.I., was elected president of the National Machine Tool Builders' Association at the group's 50th annual meeting held in Hot Springs, Va., last November.

As a result of the first mailing about our 30th reunion in June, President Grover learned that we had lost the following classmates by death: John Scott McWilliams, who had been president of Rolling Creek Water Company, died in Shamokin, Pa., February 3, 1951; Charles E. Starbird of Mesa, Ariz., died February 9, 1950; Cornelius D. Sullivan of San Diego, Calif., died December 19, 1950; Charles W. Whittemore of Buffalo, N.Y., died November 19, 1951.

New Addresses: Harold R. Blomquist, 28 Hammond Pond Parkway, Chestnut Hill 67, Mass.; Professor Edwin J. Purcell, University of Arizona, Tucson, Ariz.; Alan C. Johnston, 42 Baker Avenue, Dover, N.J.; Platt C. Benedict, Newmont Mining Corporation, 14 Wall Street, New York 5, N.Y.; Charles G. Rudderham, 505 Fourth Street, Muskegon, Mich.; Raymond F. Mann, 161 Willowbreeze Road, Buffalo 23, N.Y.; Colonel Randall J. Hogan, Rossford Ordnance Depot, Toledo 1, Ohio; Major Roland L. Smith, Camp Gordon, Georgia.—C. YARDLEY CHITTICK, *Secretary*, 41 Tremont Street, Boston 8, Mass. WHITWORTH FERGUSON, *Assistant Secretary*, 333 Ellicott Street, Buffalo 3, N.Y.

• 1923 •

This is not too early to remind you that there will be the annual meeting of the

Class on Alumni Day, June 9, 1952. A room for the purpose will be reserved at the Boston Statler Hotel and we will convene about 5:00 P.M.

Howard Russell sends in a clipping from the New York Times of January 6 reporting that Walter Dietz, President of the Electrolux Corporation, has been named president of the Vacuum Cleaner Manufacturers Association. — The heads of two of the departments at M.I.T. are Class of 1923 men. Bernard E. Proctor is head of the Department of Food Technology and Nathaniel H. Frank is head of the Physics Department. — Brigadier General Carroll H. Deitrick is commanding general of the Ordnance Tank-Automotive Center at Detroit. In November, he appeared on the weekly television interview sponsored by the Detroit Free Press and television station WXYZ-TV. In this interview, he reported on the progress of the defense mobilization effort.

Ben Cooper, of the firm of Taller and Cooper, Inc., of Brooklyn has developed, among other things, a toll collection system now used on nearly 100 of the nation's bridges, tunnels, and express highways. A clipping from the New York Herald-Tribune (brought to my attention by C. A. Clarke, Secretary of the Class of 1921) reports that the New Jersey Turnpike is the latest toll highway to put this system into use. Like other successful toll systems, the New Jersey system uses the principle of the vehicle's rolling motion to record its progress through a toll lane.

An item in the Stamford, Conn., Advocate is devoted to the marriage of William H. Harding of Stamford to Marian Mabee McManus of Old Greenwich, Conn., on November 24, 1951. Harding is a chemical engineer and was formerly executive director of technical service and development at American Cyanamid. The couple plan to live in Stamford. — HORATIO BOND, Secretary, National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass. HOWARD F. RUSSELL, Assistant Secretary, Improved Risk Mutuals, South Broadway, White Plains, N.Y.

• 1924 •

Maybe you thought we wouldn't have any material for this column after the big Christmas newsletter. Perish the thought! You fellows have been making plenty of news lately.

Let's start off with a new president. Cyrus W. Haller has been elected president and director of Victoreen Instrument Company of Cleveland. For many years Cy was with Sylvania. During the War he headed their proximity-fuse program. Four years ago he became president of Pioneer Electronics. Seems that Victoreen has now acquired at one fell swoop both Pioneer's stock and president. Don't know the stock, but, knowing Cy, it sounds like a good deal. Thomas P. Coogan, Florida builder and past mayor of Surfside, has really tackled a job of work this time. He is now assistant secretary of defense in charge of military housing. He's probably finding the problems a bit different from building homes in Miami. Rear Admiral Frank G. Fahrion, for the past year and a half commander of the Atlantic Fleet's destroyer force, has now been shifted to

command the same fleet's amphibious forces. With the change goes one in rank. He's now a vice-admiral.

Charles H. Deming, trust representative of the National Shawmut Bank of Boston for the past 12 years, has now been named assistant trust officer. And at a time when an \$85 billion budget has just been announced, it's heartening to know we have one classmate at least who is doing something about keeping it down. Lawrence B. Feagin, chief technical assistant to the St. Louis district Corps of Engineers, was awarded the emblem for meritorious civilian service for "unusual initiative and competence" in cutting expenditures of government funds. Faced with the job of building revetments along an eight-mile channel, Larry decided they could be built from heavy, open-hearth slag available for no. The only discouraging thing about the whole deal is the fact that such an accomplishment rates a medal because it's "unusual"!

Probably a lot of us make speeches as a regular thing. Two have come to our attention recently. Professor Ralph E. Winslow, head of Rensselaer's Department of Architecture, spoke in Albany on "Modern Trends in Building Construction." And in Wellesley, Harold L. Hazen gave the Unitarian Service Committee a run-down on that Japanese educational mission he headed last summer. Harold, as you know, has been head of the Institute's Electrical Engineering Department for some years. On July 1, however, he leaves that post for the rarefied atmosphere of a dean. He will become dean of the Graduate School. And, incidentally, that gives '24 two deans at M.I.T. — Tom Sherwood, Dean of Engineering, is the other, of course. A letter from Robert O. Dehlendorf informs us that he is no longer with Jack and Heintz. He left that fabulous organization last year, and is now in Chicago with the A. O. Smith Corporation. Bob's sons, incidentally, don't seem to care about following in their father's footsteps. One is at Amherst, two more are heading in that general direction. Evidently Ray Hamilton's offspring prefer the liberal education too. One of his sons is at Middlebury where Bill Robinson's daughter, Jane, is also a student. Christmas was a big day in Bill's household, by the way. His youngest, Ginny, took her first steps on that day. Probably pulling decorations off the tree!

Johnnie Fitch claims that he did not "shed his bureaucratic mantle" as stated in our recent newsletter. After 18 years of working for Uncle Sam, he left "to avoid putting one on." He is now living in Bronxville. Lieutenant Colonel Hugh L. Walker is back in uniform again, "going around for the second time on an involuntary 17 months" with the Air Force. He's not flying the Hump this time though, but a swivel chair at Stewart Air Base in Newburgh, N.Y. Senator Blaylock Atherton is evidently doing the things expected of a gubernatorial candidate. In December he donned academic robes, and represented M.I.T. at the inauguration of a new president at Plymouth, N.H., Teachers College. Also in December, at the big Schooler party in New York, Nate celebrated simultaneously the

opening of new offices and his 20th year in business. Paul Cardinal is trying to beat Bill MacCallum's transcontinental touring record. The Hoffmann-LaRoche house organ, in a recent issue, carried a story of some of his wanderings under the heading "V.D.'s Cardinal, Migratory Bird." We won't go into details except to say that Paul engaged in widely diverse activities, such as inspecting a grape juice plant, visiting an Indian arrowhead museum, going down to defeat at the hands of Harold's one-armed bandits in Reno, cornering a lady spy in Spokane, and trying to drink three redheads under the table in San Fernando. There was a plug there telling how H-LaR vitamins turned the trick. Paul finished on his feet. At the moment he's headed for Havana, probably looking for new fields to conquer. With all due respect, we're betting on Mike Amezcaga, vitamins or no.

It is with real regret that we record the passing of another classmate, Lon S. Gregory. Since graduation he had been in the oil business in Oklahoma, in recent years as a consulting engineer heading his own firm. Lon leaves a widow and a daughter.

Richard C. Eaton has evidently left the aircraft business, at least as far as Grumman is concerned. He has now become a Cape Codder with an office in Yarmouth, although so far our scouts have failed to discover what he's doing. Maybe Russ Ambach or George Jones or somebody else down that way can track Dick down. And a final plug for Frank Shaw. At the moment our Alumni Fund record is second only to that of 1922 in the classes of the '20's. We're doing very well, but there are still a lot to be heard from. If you haven't yet sent in your check to the 1952 Fund, this is an opportune moment. Just think how you'll appreciate it when you make out your '52 income tax! — HENRY B. KANE, General Secretary, Room 1-272, M.I.T., Cambridge 39, Mass.

• 1925 •

All of you realize by this time that Fred Greer has taken over the Alumni Fund responsibilities for the Class of 1925. We hope you will get behind him and give your wholehearted support.

Within the last week it has been announced that Thomas Killian, VI-A, has been appointed chief scientist of the Office of Ordnance Research at Duke University in Durham, N.C. Tom has been science director of the Research Divisions, Office of Naval Research in Washington for the past several years and will assume his new duties in February. A recent item in the Brooklyn Eagle indicates that Chink Drew, XV, has accepted the chairmanship of the Employee Group Solicitation Division of the Salvation Army's 1952 appeal for the Brooklyn, N.Y., area. Chink, as most of you know, is general sales manager of A. Schrader's Son, Scovill Manufacturing Company, Inc. This article goes on to mention his prowess in the field of intercollegiate athletics, something that all of you have known for years.

All of you heard of the heavy dew in California during the past winter, but I think you may be interested in George

Blonsky's description which I quote as follows: "Something is wrong about California. This winter suddenly the celestial plumbing sprung a leak, and after 10 years of drought we got one heck of a wet winter. About two weeks ago one single rain brought down five and one-half inches and today it seems to want to repeat that performance. We are just about to jump in our submarine and start out for Hollywood." Another news item indicates that Wally Squire is now the president of the Natick, Mass., Chamber of Commerce.

On January 15, Ave Stanton called a meeting of the 1925 Working Committee. The immediate purpose of this meeting was to take action with the hope of assuring a good class attendance at the mid-winter alumni meeting, held in Walker Memorial on January 31. Also it was agreed that Fred Greer would include with his next Alumni Fund letter a call for annual dues of \$1.00 for the 1952 period and further ask for an indication as to whether or not a class reunion should be planned for 1953 — such a reunion to be held on the M.I.T. campus. If you have not already done so, please send in your answers to the Secretary. Plans were made to have a Greater Boston 1925 dinner on Tuesday, April 15, 1952. All class members in the Greater Boston area will receive notification regarding this meeting at a later date. Any members of the Class who can plan to be in this vicinity on that date will be most welcome, and we ask that you drop the Secretary a line so we may be able to provide for you. As indicated above, the date is April 15, 1952; the place is the Campus Room, M.I.T. Graduate House; the time is 6:30 P.M. Dr. Killian has already indicated that he will join us and speak to the group and plans are underway to have other speakers. Mark this down on your calendar now. — F. LEROY FOSTER, *Secretary*, Room 5-105, M.I.T., Cambridge 39, Mass.

• 1926 •

Well, here's an issue of class notes *not* written at Pigeon Cove. Last year at reunion a number of classmates, particularly ex-New Englanders, mentioned that they like to hear about these parts. That's why we try to start off with a bit of nostalgia. This Sunday morning, however, upon sitting down with our pencil notes and the '26 *Technique*, large snowflakes began to fall. With roads already icy, we decided to toss our bags into the car and start for Boston, which to us is Winchester. The sea had been wild and the winds of terrific velocity, so for once it was no hardship to leave. As a result, the notes are being pieced together bit by bit in the evening, before breakfast, on the commuter's train, in the subway, and so on.

Just as we seem to be getting close to the bottom of the barrel some good '26 Samaritan always drops a windfall into the mail and gives us a bit of chatter to add to the notes. Bruce Humphreville recently came through with an interesting bit of "Twentysixiana." Inspired by our story about Bill Lowell's discovery of the old class movie, Bruce also did a bit of attic cleaning. Result: Your Secretary now possesses a grimy little notebook, on the

cover of which is printed "M.I.T. 1926 Class Dinners." Opening to page 1, we find a secretary's report written by our late classmate, Elmer F. Knight. These dinner meetings were held from 1927 to 1930 by the group of '26 men then in New York City. Bruce later became secretary of the group and some of the notes of meetings are very, very interesting. Wish they were printable though. There are things here and there, however, that can be quoted and it will also be interesting to list some members of the Class who attended the dinners. While the meetings were organized in November, 1926, the first one reported was that of January 12, 1927, and the signatures of those who attended were: Whitney Ashbridge, A. Sidney Brookes, Arthur E. Benson, Francis A. J. Brown, Chester F. Buckley, Alfred E. Burton (then dean of students and speaker of the evening), Alfred H. Dolben, T. R. Hughes, Elmer F. Knight, Joseph L. Levis, Richard S. M. Lee, I. R. Macdonald, P. S. Mancini, R. A. McLachlan, A. D. Petterson, B. P. Rosser, Shady Shaheen, N. J. Sapienza, J. L. Suydam, Edward E. Talbot, Francis V. Zendzian. It is interesting to look over this list and see how many are still in and around New York City. I can only spot two that I am sure of — Pete Ruggles and Dick Lee; and, as secretary, I know most of the men. Wow! did they scam out of New York when they got the opportunity. Looking through later lists of meetings we find that the same men attended quite regularly but other names also appear: Sam Cole, Herb Creedon, Maurice Fish, Bill Franklin, George Ferguson, and Tom Green came to a later meeting. At one meeting the notes state: "Four new faces appeared tonight — John Holmer, Al Entwistle, Roscoe Wood and last, but most potent, Stark Draper." If you read this, Drape, note that the date of this meeting was April 13, 1927! The last paragraph of Humphreville's notes for the March 19, 1930, meeting were: "The next move was to adjourn at nine o'clock in favor of a poker party at Ted Faithfull's in Tudor City." These old notes certainly sound like a '26 gang all right, all right. Good fellows getting together.

We still have a large number of thumb-nail sketches of classmates who attended the reunion, and with only 11 knocked off in three issues a speed-up is indicated if we are to whip up a class biography. Therefore, this month we have purposely selected short sketches so that more men can be represented in your scrapbook.

No. 12 — BARRY C. HUMPHREYS — Hump lives at 2 Cowles Avenue, Rye, N.Y. He is married and has one son (also a dog and cat). Mrs. Barry was a Wave and, to quote Hump, "a Wellesley graduate, of course." Hump is in the industrial relations business; his business address has been New York City for 20 years.

No. 13 — BAYLOR, SIDNEY H. — 30 Pinckney Street, Boston (that's Beacon Hill) and Johnston, Vt. (legal address). Sid is married and has two daughters. His business, to quote, "peddling heat treating equipment," Eastern Appliance Company, manufacturers agents, Boston. Other activities have included a little farming in Vermont and a six-year stretch

as a politician (alderman in Newton, Mass.).

No. 14 — BRISTOL, REXFORD A. — Rex lives in Foxboro, Mass. His family consists of his wife, Margaret, and three daughters — Betsey, Barbara, and Margaret. His business affiliation is with the Foxboro Company as treasurer and he is also president of the Foxboro National Bank. Rex's extracurricular activities include: trustee of Suffolk University and president of Old Colony Council, Boy Scouts of America.

No. 15 — CALLAHAN, WILLIAM H. — 1 Rowe Place, Franklin, N.J. Bill is married and has two daughters. He has been with New Jersey Zinc Company for a long time and is now manager of the New Jersey Zinc Exploration Company. His terse answer to the question asking what he has been doing for the past 25 years is, "prospecting for mineral deposits."

No. 16 — CHASE, DONALD C. — 191 Gulf Street, Milford, Conn. Don is married, has two boys — one 17, the other 14 years old. He is manager of the Rubber and Plastic Division, Farrel-Birmingham Company, manufacturers of heavy equipment used in processing rubber and plastics. Before joining his present company in 1940, Don had been in the rubber industry since graduation with Kelly Springfield's Engineering Department.

No. 17 — ENTWISTLE, A. L. — 401 Ormond Road, Louisville, Ky. Al's family in addition to his wife is a girl, eight, and a boy, six. He is vice-president of the Mengel Company at Louisville.

No. 18 — FRENCH, ALFRED W. — 50 Orchard Road, Piqua, Ohio. Al's family: two sons and a daughter. Al is vice-president of French Oil Mill Machinery Company at Piqua and I believe he has been with this company since graduation. Last June was the first time Al had been able to get back in 25 years, and we had hoped to ask him some questions about French Oil Mills. At any rate, we know that Al does much traveling, especially in the oil-field areas.

No. 19 — GABRENAS, ANTHONY P. — 206 Renfrew Avenue, Trenton, N.J. Gabby calls himself a land surveyor. His activities over the years have included bridge design for the state of New Jersey and survey and construction work on an air base in Cuba.

No. 20 — HARRISON, C. A. — Clocks Boulevard, Amityville, N.Y. Dave gives us his wife's maiden name, Fannie E. Collins, and then comes the real surprise. This one got by us when glancing through the records. Dave has five daughters! Their ages range from 11 to 20. If we had known that at reunion, there would have been a special prize. It's still not too late for a toast; so for the Class of '26, five times do I raise my stein on high! Dave is vice-president of Fairchild Camera and Instrument Corporation, and when we were looking through the little notebook, mentioned above, covering the class dinners in New York 25 years ago, we noted that Dave attended and was with Fairchild then. He was active in the M.I.T. Development Program and either has been or is a member of the school board in Amityville.

No. 21 — HILL, NORMAN C. — Box 450, R.D. 5, Akron 19, Ohio. N.C. has three girls

and one boy and he makes special notice of the fact that he has four grandchildren. We feel quite certain that he leads the grandfathers of the Class but if anyone cares to dispute him, we will referee the argument in this column. N.C. is with the C. P. Hall Company, manufacturers of rubber chemicals.

No. 22 — HOWE, B. V. — 426 Cooper Building, Denver, Colo. Ben has one daughter and a grandson — another grandpappy! After 15 years as state sanitary engineer, Ben went into consulting in Denver (Ripple and Howe). He has given up golf because he was too busy, but goes to old Mexico each winter for a month and a half. Figure that one out. Ben recommends that our 30th reunion be held at Acapulco. Sounds like a swell idea but . . . figure that one out, too.

No. 23 — JOHNSON, RICHARD W. — 203 High Street, Newburyport, Mass. Dick has been with the Massachusetts State Highway Department in road design ever since graduation with the exception of his four years of military service. Dick has no grandchildren; he's single! At our 25th reunion he was the casualty in the famous ball game — sprained his arm and had to visit the doctor. We are pleased to report complete recovery and Dick will be in his position on the "baldies" team at our 30th.

No. 24 — LISSNER, EARL DEWITT — 8 Arlington Place, Fairlawn, N.J. I'll let you guess what he means in some of his answers. Under family he has written "all female" and under nickname, "unprintable." You can use your imaginations. He is industrial fuel representative for Public Service Electric and Gas Company, and states that for 25 years he has been hibernating and playing either treble, feeble, or perhaps he means terrible chess. At least, it's chess.

No. 25 — MAHONEY, PAUL L. — 35-34 77th Street, Jackson Heights, N.Y. Paul is with Spraylet Corporation, 1 Park Avenue, New York City. He has three boys: one 14 years old and twins, 11 years old. How far is Amityville from Jackson Heights? Seems to us that the families of Dave Harrison and Paul Mahoney should become acquainted.

That's all for this month; see you in April. Remember, keep sending in your news flashes. — GEORGE WARREN SMITH, General Secretary, E. I. du Pont de Nemours and Company, Inc., Room 1420, 140 Federal Street, Boston, Mass.

• 1927 •

It is with deep regret that we report the death of Professor Alan D. Whittaker, Jr., on October 8, 1951. At this time there is no further information other than the fact that Professor Whittaker was living in Mill Valley, Calif. Since writing the February class notes, we have received the following information concerning the death of Raymond D. Leonard, on November 11, 1951: "Several weeks earlier he was in an automobile accident and apparently had recovered from his injuries. However in his weakened condition he was not able to fight off a virus which attacked the muscles and arteries around the heart. The end came at the hospital in Longmeadow, Mass. He lived with his wife, Barbara, and a son and a daughter

at Long View Drive, Longmeadow, and was the New England representative for the Pittsburgh Coal Company. His son recently joined the Marines, and his daughter is training in Boston to be a nurse. Ray was active in the alumni affairs of his chapter of Alpha Tau Omega and was a captain in the Reserve Officers' Corps."

Glenn Jackson had a very interesting letter from Amund Enger from Oslo, Norway, part of which we quote here: "We have been doing some export business in hunting and target rifle ammunition to the United States since the War and volume may, I hope, pick up so much that it would warrant the trip to New York City and give me an opportunity to attend the reunion. The ammunition game is a family proposition. My father and two brothers started it back in 1895, branched out into Sweden and Denmark before the first World War, and I have been at it ever since I left school, with the exception of one year in Germany and one in France. We worked for the home market almost exclusively before the War, but since the German ammunition factories were knocked out we have been getting a lot of this business from abroad as there are an awful lot of rifles taking these European-type cartridges all over the world, the United States inclusive. Another factor is that the G.I. wants to shoot the souvenir rifle which he brought back. Since my father died in 1943, I have been the manager and this necessitates constant trips to Sweden and Denmark, a life which I like very much. Before the last war I also used to go to the Continent several times a year on business, but this has been discontinued. After the occupation, we reconditioned the plant and we now produce more than we did before the war. The same thing happened in Denmark, but we were fortunate in that the Swedish plant — Sweden being neutral — was running the whole time and could give substantial help in rebuilding the other two. I married in 1930 and have two daughters: Anne Marie, aged 16, and Tiril, aged 9."

A brief note indicates that William B. Duffy was recently elected vice-president of the New England Water Works Association. Appointment of three executives of the Arabian American Oil Company to newly-created managerial posts included R. S. Hatch, who was named general manager for materials, supply, and traffic.

George C. Houston has been appointed manager of manufacturing training in the General Electric Company's manufacturing personnel development services department, Schenectady, N.Y. He was formerly supervisor of manufacturing training of the company's large apparatus division, and will be responsible for various training programs within the department. George has been with G.E. since 1946, when he left New Jersey Law School. At that time he joined the Hanford Works at Richland, Wash., operating for the Atomic Energy Commission. — More than 160 civilians and 135 reserve officers of the armed forces have registered for the field economic mobilization course of the Industrial College of the armed forces which was given at Moose Hall, Des Moines, Iowa, in December. Colonel Wil-

liam P. Berkeley, U.S. Air Force, is on the faculty of the school. In both wartime and postwar duties he participated in joint and combined committees of the combined chiefs of staff. — JOSEPH S. HARRIS, General Secretary, Shell Oil Company, Inc., 50 West 50th Street, New York 20, N.Y.

• 1928 •

Our good and able Secretary, George I. Chatfield, has been so busy of late in his new activity as vice-president of the Compton Advertising Agency, in charge of all Ivory bar soap advertising for Procter and Gamble, that he hasn't had an opportunity to prepare notes for The Technology Review. This busyness on his part permits me the opportunity of reporting to you on his steady climb up the ladder in advertising and merchandising circles which his modesty has kept from the class notes columns. As you will recall, George took his first job in 1928 with Lever Brothers, leaving there in 1947 to become vice-president of Kenyon and Eckhardt, an important leading advertising agency in New York City, from which post he left two years ago to assume direction of the Ivory advertising account. I know that all members of the Class will take pride and pleasure in this remarkable accomplishment by our Class Secretary.

Dudley Smith has left Honolulu and is now living at Dayton Road, South Glastonbury, Conn. In Dud's Christmas letter he writes of his trip from Honolulu to the West Coast and of an interesting journey across the country visiting friends en route. Dud has two boys, one of whom is now at Princeton and the other at Phillips Andover Academy. Dud is working at Pratt and Whitney in East Hartford and would appreciate seeing friends and classmates in that area. Ernie Knight has been called back into the Air Force and is now serving in Japan. We learn from Arthur Josephs that he has a new addition to the family — a son, Howard, which M.I.T. will welcome in one of its future classes.

Victor J. Decorte called at M.I.T. recently while on vacation from his assignment for Standard Oil of New Jersey in Rome, Italy. Vic worked for International Telephone and Telegraph for five years after graduation, resigning in 1933 to attend the Harvard Business School, graduating with distinction in 1935. Since then, Vic has been with Standard Oil and is now managing director of Stanic Industria Petroliera, Corso d'Italia, 39-A, Rome. Vic extends a cordial invitation to all classmates visiting Rome to call at the Decorte home.

It is relatively only a few months away from our 25th reunion in 1953. Plans for this program will be made as early as possible and notices will be sent to all members of the Class. Please be sure, however, to mark your pad to reserve the week before Alumni Day, 1953, for a trek back to Technology to see all the goings on since we left in 1928 and to match waistlines and hairlines of other men in the Class. Alumni Day for 1953 is tentatively set for Monday, June 15, which means the reunion probably will be

scheduled for Friday, Saturday, and Sunday previous to Alumni Day. — Both George and I know how busy all of you men are, but at the same time most people are anxious to see information in *The Technology Review* under class notes. George will be back in print shortly and when he finds it difficult to make the schedule I will try to pinch-hit for him. — RALPH T. JOPE, *President*, Room 1-274, M.I.T., Cambridge 39, Mass.

• 1936 •

Your Secretary apologizes for letting the January and February issues of *The Review* go to press with no news from the Class of '36. However, in spite of our request in the December issue for items of interest, there has been little response. Are you fellows reading *The Review*? We all probably have tight schedules these busy days, but let's co-operate and try to send in at least a post card from time to time so that your Secretary will have material for the purpose of writing up the class notes for *The Review*. We have been well represented for the past year so don't have the Class of '36 do another disappearing act.

Congratulations to Bill Shockley — Dr. William Shockley — head of the Transistor Physics Research Department of the Bell Telephone Laboratories at Murray Hill, N.J., who has been named recipient of the Morris Liebman Memorial Prize for 1952 by the board of directors of the Institute of Radio Engineers. Although we haven't any details on this, the award undoubtedly was made for his contribution to the theory and practical application of transistors, which are the first serious competitor for electron tubes, such as are used in radio receivers. As of December 1, Norman T. Robey was made assistant general superintendent, covering the Wood River, Ill., and Casper, Wyo., refineries of the Standard Oil Company (Indiana). Why don't you drop us a line, Norm, and let us know how you are enjoying your added responsibilities.

That is the extent of the news for this issue. We will promise to do better next month if some of you fellows will give us a little assistance. — ROBERT E. WORDEN, *Secretary*, Fidelity-Philadelphia Trust Building, 123 South Broad Street, Philadelphia 9, Pa.

• 1937 •

Greetings for the new year, since this is the first time in a long time we have had a worth-while supply of news. Plans are going along for our 15th reunion, which we hope will be a success. We're probably a little grayer and balder (don't know how that's possible in my case!).

Joe Heal reports as follows concerning the first action on our forthcoming 15th reunion: "The co-operation of everyone in the Class is needed, both in working on the reunion committee and in talking it up in various vicinities if we are to have a top-notch reunion. Your co-operation in filling out the questionnaire and making suggestions is a must, as this is *your* reunion. To bring you up to date, here's what has gone on so far: The first meeting of the 15th reunion committee was held at the home of Phil Peters on December

17. In accordance with the Alumni Association's manual on class reunions, the following were assigned specific responsibilities: Joe Heal, publicity; Phil Peters, banquet chairman (in addition to being chairman of the committee); Bob Harris, secretary; Bob Thorson, reunion location survey and hotel arrangements. Other subcommittees to be established will include Attendance Committee, which will later function as Reception and Program Committee, Transportation Committee, and Financial Committee.

"We plan to limit consideration of a reunion place to the area south of Boston, in the general vicinity of Cape Cod. This location would have the advantage of being more accessible to Alumni from the metropolitan New York area. Bob Thorson will make a preliminary survey of suitable places for the reunion. Specifically suggested spots were the Hotel Mayflower at Plymouth, Mass., and the Oyster Harbors Club at Osterville, Mass. It was decided that the reunion should commence the Friday immediately preceding Alumni Day and should end on the morning of Alumni Day, Monday, June 9, 1952."

On Alumni Day, June 11th, last year, three fellows registered: James D. McLean, S. Curtis Powell, and Walter S. Wojtczak. There is just one wedding to report: Frances P. Pratt of Pratts Junction, Mass., to George Otis Tapley of Portland, Maine. Wonder how many of the fellows are still bachelors. Got a clipping about J. B. Cohen of North Andover, Mass.; he certainly is far afield of engineering in his latest activity — that of racing greyhounds. The article didn't say whether his kennels are a full-time proposition or not. Daniel Tower was elected director of the Worcester Employment Society, Inc., a society for fostering an interest in handicrafts. He is regularly with the Rhode Island School of Design after having studied under fellowships in Europe. Daniel J. Hanlon, Jr., has been admitted to the Ohio State Bar. Colonel Richard Surbeck recently returned to this country for a visit, having been in Paris with his family for the past year and a half. Captain Paul R. Drouilhet is the operational commander of the "Hurricane Hunter" squadron, a group of men who fly right into a hurricane and collect important information about the storm's direction, speed, intensity, and so on. Phil Peters, who heads up our class reunion committee, is now vice-president of John Hancock Mutual Life Insurance Company, and recently was the principal speaker at the monthly meeting of the Boston chapter of the National Association of Cost Accountants.

James M. Ewell is now general production superintendent of Procter and Gamble Company of Cincinnati. Walter Lee Hughes, assistant professor of physical chemistry at Harvard, was awarded the John Simon Guggenheim Memorial Fellowship to study some specific groupings of purified proteins. Wayne M. Pierce was named manager of operations of the Norden plant in Milford, Conn. Robert E. Hopkins was appointed to full professorship at the University of Rochester, where he has been a member of the university's Institute of Optics since 1938.

Verner C. Kreuter, Jr., was elected director of the American Laundry Machinery Company last year. It's funny how news has changed. Before it seemed to be all marriages and babies; now we hear how your education paid off. By gosh, I'm still president of my own company! This is old news but good: William B. Bergen was elected vice-president and chief engineer of the Glenn L. Martin Company where he has been working since graduation. G. A. Siegelman is now manager of the alkylation department at the Wood River Refinery of the Shell Oil Company. Frederick R. Claffee was appointed assistant manager of the industrial relations division of Du Pont Company's employee relations department. Dick Ewert is now general manager, office sales division, of White-Rodgers Electric Company of St. Louis.

From our Assistant Secretary, Colonel Walter Blake, who at present is located at White Sands Proving Ground, comes the following: "Your Assistant Secretary is way off the beaten track in an arid New Mexico mountain valley on a 15-months tour of active duty for the questionable benefit of the Army guided missile program. I'm sure there is no '37 man within 500 miles about whom to report. Christmas cards brought sparse news. Bill Burnet was snowbound in Minneapolis, as per usual. Also there is a rumor that Jim Thomson, our freshman- and sophomore-year class president, has set up shop in Dallas, Texas, as a manufacturer's representative. Harry Goodwin is still with the Battelle Memorial Institute, Columbus, Ohio — in research and development. Jim Newman is now a 'big operator'; perhaps this is better phrased as 'still a big operator.' He is now a partner in Booz, Allen and Hamilton, management consultants in Chicago. That is the limit of my knowledge of the Class of 1937."

If you have never been mentioned in this column, let me hear from you so we can put you in. Your friends and classmates certainly would be interested in hearing about you. Plan to be at the reunion! — WINTHROP A. JOHNS, *Secretary*, 34 Mali Drive, North Plainfield, N.J. WALTER T. BLAKE, *Assistant Secretary*, White Sands Proving Ground, Las Cruces, N.M.

• 1938 •

We have one marriage this month: that of Margaret Towne of Waltham to Earle MacLeod, in the middle of last December. They are now living in Syracuse. Congratulations, Earle!

Dick Muther says that he has left the management consulting business. After four years of varied consulting assignments, he has picked Electra Manufacturing Company of Kansas City as the place to settle down. He arrived there last July, just in time to be properly baptized in the flood waters. His company produces electrical products for the automotive industry and makes a line of deposited-carbon resistors. Dick is assistant to the president and will handle a wide variety of special projects. Johnny Roehrig is now associated with the National Research Corporation as a project manager in the company's physics research department.

At Fort Monroe, Virginia, Robert R. Fisk has been promoted to the rank of lieutenant colonel, according to word from the chief of the Army Field Forces. He is assigned to the ordnance section of the Army Field Forces, the organization which insures that individuals and units of the Army are trained for combat.

Bill Burrall writes: "We have bought a home in Whittier. I'm a research engineer with North American Aviation. My wife, two daughters (six and eight), and I all like California very much." We have also heard from Bert Grosselfinger, who says: "I am still with Hydrocarbon Research, Inc., in the sales engineering department. Spent an interesting vacation in Mexico last July dividing my time between Mexico City, Acapulco, where I was a guest on the President's yacht, and Yucatan. I was particularly interested in Yucatan since I have always wanted to visit the old Mayan cities and found them up to my expectations, especially Chichen Itza and Uxmal. Last Thursday I met Frank Dowding at the Chemical Exposition here in New York. Frank is now with the Jefferson Chemical Company in New York. Also saw Fred Ray a few weeks ago when visiting the Socony-Vacuum refinery at Paulsboro, N.J."

Thys Boissevain is a design engineer at Electric Boat Company, Groton, Conn., working on the atomic submarine, *Nautilus*. His wife and four children are still on their farm in Kingston, Mass. Thys writes: "When will we beat submarines and jet planes into plowshares?" Good question, and worthy of much more thought. Another one we heard from recently is Al Clogston: "I'm still at Bell Telephone Labs, Murray Hill, N.J., doing research on electron tubes and other things. I am very busy locally on civilian defense (important business in a 50-mile circle around New York City) and in a volunteer ambulance corps. Just operating a house is practically a full-time job, as you probably know. Painted my house this summer; whew!" We had a Christmas card from Russ Coile with an interesting note: "I am over here in the Mediterranean on the staff of the Commander Sixth Fleet until next summer. Working for M.I.T.'s operations evaluation group at the Navy Department. Certainly is one way to see the world. Last year I was in Korea at Thanksgiving; this year I ate my turkey dinner in Istanbul, Turkey. I am in Africa (Tunisia) at the moment. Bill Whitmore has persuaded two more people in the O.E.G. to buy M.C.'s so now there are four in our group." — ALBERT O. WILSON, JR., *General Secretary*, 24 Bennington Road, Lexington 73, Mass. *Assistant Secretaries*: DAVID E. ACKER, 210 Woburn Street, Lexington 73, Mass.; RICHARD MUTHER, 116 West 67th Terrace, Kansas City, Mo.; FREDERICK J. KOLB, JR., 211 Oakridge Drive, Rochester 12, N.Y.

• 1940 •

Sorry there was no '40 column in the February issue of *The Review*, but as I had not heard from any classmates there was no news to relate. This month was a different story. Received several Christmas cards with notes attached. Henry and

Dorothy Harrison's card was a picture of their four children. The three oldest are boys and I could not tell from the picture about the baby. Jay and Peggy Dienes also had a personalized card with their two daughters and dog as the center of attraction. Peggy enclosed a note stating that they were back on the East Coast again, as Jay is now at the Brookhaven National Laboratories at Upton, Long Island, N.Y. They like Long Island and are glad to be back east. Peggy has not returned to work yet. Sam and Doris Omansky also enclosed a note with their card. Sam is now the technical director of the Grand Union Company, a large food-chain organization in the New York area. Arnie and Shirley Arch enclosed the news that Arnie was back in the Army again as a major at the New York Chemical Corps Procurement District. My last card was from Hap and Alice Farrell. Hap writes: "One of my New Year resolutions is to write you a letter." This is one New Year resolution that I hope will not be broken.

Alban T. Hallowell and Barbara M. Gawthrop became engaged last October. Alban, who received his doctorate with us, is employed at the Parlin, N.J., plant of E. I. du Pont. Bob Bittenbender, who did such a fine job on the 10th reunion, has recently joined the mechanical division staff of Arthur D. Little. Previously Bob had done structural and test work for Curtiss-Wright Corporation and machine design for Jackson and Moreland. He had also been a group leader of the mechanical design section of Sylvania Electric Products, Inc. Fred Hammesfahr has been appointed in charge of the Chemical Process Development Laboratory's (Pittsfield, Mass.) group of the General Electric Company's Chemical Division. Previous to joining G.E., Fred was employed by E. I. du Pont as a development engineer and then, after three years in the U.S. Navy, was a development engineer with the General Tire and Rubber Company.

The class account in the First Federal Savings Association of Washington was \$904.43 as of January 1st. Let's try to make it \$1,000 by next year. Don't forget your class dues (\$2.50 for five years) and also don't forget to contribute as generously as you can to the Alumni Fund. — ALVIN GUTTAG, *General Secretary*, 7114 Marion Lane, Bethesda 14, Md.

• 1945 •

Dave Cohen dropped us "his first line" the middle of November. After working for General Electric at Lynn through '47, Dave left the field of engineering and joined his father in a Chrysler-Plymouth agency. Business must have been good, for Dave took the big step in March, 1948, when he married Babette Malkoff of New York. Jay Douglas was born in May of the following year, making him now a strapping youth of almost three. Dave has seen quite a bit of Bob Roth, Marty Walzer, Sandy Neuhaus, and Al Cohen. It was interesting to learn that Bob is in sales, while Marty has set up a law office in New York. Along with all the good news, Dave had a little bad as well. He too has been caught. Dave's orders called for him to re-

port to the Military Sea Transportation Service in Yokohama, Japan, the 11th of February. While visiting BuPers in Washington, Dave learned that many more boys who were in V-12 would be receiving orders to active duty in '52. However, Dave's letter closed on a much lighter note when he vowed he would make a stronger attempt to get in news items and attend alumni reunions. An excellent New Year's resolution for us all!

Ed Stoltz wrote about Thanksgiving time to say that he was going to get married on Washington's Birthday to Elinor Weibel of Clairton, Pa. Elinor is a graduate of Pennsylvania College for Women and was executive secretary to the public relations director at U.S. Steel in Pittsburgh. The newlyweds are expected to live in or about Wheeling, W.Va., so Ed will be in the center of his Johns-Manville sales territory. The first of December I received a lengthy communiqué from Richard R. Martin who went back into the Navy over a year ago. Dick, wife, and year-old son Richard Dean are situated in St. Paul, Minn., where Dick is attached to the U.S. Naval Computing Machine Laboratory, concerned with technical liaison and inspection of electronic equipment. Dick reports the following about Bob Bronson. Bob has a family of four children which, incidentally, I believe is high for the Class. After leaving Eire, Pa., in the fall of 1950, on his way to Texas, Bob received his orders from Uncle and three weeks later was bound for a destroyer, U.S.S. *Gurke*, off the coast of Korea. Last reports indicate Bob was working 16 hours a day preparing to fill the billet of engineering officer.

Marshall Byer reports that he, too, is back in the Navy stationed at the Office of Supervisor of Shipbuilding and Naval Inspector of Ordnance in New York. Marshall reported October 29th and found that Eddie Washburn had been there about two months. Marshall received his master's at the Institute in '47 before going to work as a test engineer at the Foster-Wheeler plant in Dansville, N.Y. In November, 1948, Byer went to work for Corning Glass as a process engineer. I've previously reported his marriage to Dot Van Fleet but not the arrival of identical twins, Deborah Ellen and Judith Yvonne, on August 17, 1950. While on the subject of children, Nick and Rosemary Mumford report the arrival of their third child and first daughter, Ayliffe Blake, on November 19. Nick didn't have too much other news on his Christmas card except that he had heard the Jack Freibergers were expecting their first child the first of the year.

Jerry Patterson reports that his first year of active duty is over and that he anxiously awaits his R.A.D. (release from active duty!) in the last quarter of calendar '52. Pat spent most of last year out in Japan on the U.S.S. *Hector* (AR-7) but managed to get back to school in September. His ship is back in the United States now, so Jerry, Libs, and the boys are out on the coast at Long Beach Naval Shipyard. Speaking of shipyards, my duty here at Portsmouth Naval Shipyard in good old New England has turned into a good deal as Naval duty goes. I'm an as-

sistant planning and estimating superintendent in the Planning Department, with active fleet submarines in the yard for repair under my wing. There has been sufficient spare time in my Navy life to enable me to become engaged. Francesca Judkins of Haverhill, Mass., and I are to be married in June. Frannie is a Smith graduate, class of 1949, and presently is an assistant buyer at Jordan Marsh in Boston.

Assistant Secretary Bill McKay came through with a fine newsletter soon after the first of the year. To say the least, Bill is not particularly happy with his Navy. As many of you know, Bill, Betty, young Bill, and David have been down at the Naval Air Station in Pensacola, Fla., where Bill has the "honor" of being a communicator and cryptographer, standing the following watches: three nights, three days, three evenings, and then three days off. It seems that the Florida weather hasn't been too sharp but little Willie will pull through no doubt. Understand Bill and Betty are expecting their third in early May. Bill reports the following items. Ray and Jeanne Pelley had their first child, Ray, Jr., in November. Ray must be firmly rooted at Procter and Gamble for he has just bought a new home. Bill McKay was godfather to Ray, Jr., by proxy. Ray reports that Red Harrington received his orders for active duty but couldn't pass the physical. He is to have another opportunity to serve his country in six months. Max Ruehrmund received a letter from BuPers asking him to volunteer for active duty. Needless to say, Max is still a civilian. Bill Meade is still with Stone and Webster in Boston, and Andy Marocchi is in Pittsburgh with the Atomic Energy Division of Westinghouse. Waite Stephenson is on active duty aboard the U.S.S. *Cero* (SS225) while Rog Hood is stationed at the SupShips office in Quincy, Mass.

Last fall Pete, Lou, and Lisa Hickey moved from Hancock Village out to Concord, Mass. By the time you read this, Pete should be passing out cigars for twins were expected the first of March. Rogers Corporation of Connecticut reports that Gerald MacKinnon has become Cleveland area sales representative. Jerry went to Rogers in 1947 as a mechanical engineer in the maintenance and engineering department. For the past year Jerry has been superintendent of the Goodyear Division. Tom Hewson made the Boston headlines last November with the Hewson Clinotron, a machine which will make a blood sugar test in five minutes automatically and without error while the patient is still present. Medical men expect wide use of the machine in their study of diabetics. This machine was developed as the first in the general concept of automatism in medicine, a concept that originated with Lessells and Associates, Boston, where Tom is an engineer. In addition to Jerry MacKinnon and Tom Hewson, congratulations are also in order for Eugene Rubin who is doing aeronautical research for a year at the Royal Imperial College on a Fulbright Fellowship.

Last November we stated that we thought Chris Boland was married. A re-

cently received news clipping indicates that Chris married Jean Kirby on August 25 in Summit, N.J. Jom Hourihan '48 was best man. Chris is now associated with W. R. Grace and Company, New York. In the middle of September, Marilyn Perry's engagement to Charles H. Johnson was announced. Charlie was with the Refinery Engineering Division of Socony in New York before his recall to active duty in October in the Naval Reserve. We are pleased to report the marriage of Mary Gianakellis of Newport, R.I., to Wallace L. Whittle, Jr., in November, as well as that of Coreen Barbara Curry of Los Angeles to Robert Mack.

Fellas (and gals too!), I enjoy writing these class notes; I know you all want to see me happy so how about some news? — CLINTON H. SPRINGER, *Secretary*, 44 Church Street, Bristol, R.I. *Assistant Secretaries*: WILLIAM J. MCKAY, 15 Barrett Street, Needham, Mass.; EDWARD STOLTZ, JR., Johns-Manville Corporation, Koppers Building, Pittsburgh, Pa.

• 1948 •

Announcements of engagements and marriages received during the past month include those of Ralph Cameron's engagement to Ruth Ferris, and Edward Yost to Ann Luella Cleveland. Ralph is in his final year at Harvard Law School; his fiancée, a junior at Wheaton. Ed is employed as a city planner with the Baltimore City Department of Planning; his bride-to-be, a medical social worker at Johns Hopkins Hospital. Way back in November Charles Licht was married to Phyllis Aaron (they are now "at home" at 2529 West Fitch Avenue, Chicago); and James Bagnall married Alice Lidwin. Norbert Andres, now an ensign, was wed in December to Pauline Moran; Gordon Johnson to Edith Brigham; Philip Dick, an associate at the Massachusetts Department of Mental Health, to Mary Patricia Devlin; and Charles Dolan, serving with the U.S. Army at Fort Dix, to Edith Joan Vollmer.

James Protulis has become a member of the production department of Monsanto Chemical Company's plastics division plant in Springfield, Mass. He was previously employed by Webster Lens Company, Webster, where he was a purchasing agent and personnel manager. Ed Hanley who, less than two years ago in Denver, started a "professional service dedicated wholly to making kitchen chores a joy," has just opened a new suite of offices in that city, reflecting his firm's rapid growth. Walt Mindermann was called back into the Navy way back in February, 1951, and, at latest reports, is stationed on a submarine at the Philadelphia Navy Yard. Harry Jones has been working for the National Biscuit Company as a field engineer ever since he left the Harvard Business School. Currently, he is busy setting up equipment in a new plant out in Chicago. First impressions of the town, he reports, are cold — both socially and weatherwise, especially after enjoying most of last winter around Atlanta in the deep South. Another classmate doing a lot of traveling is John Kirkpatrick, who is still with A. D. Little doing marketing research and area development work. A

letter from Norm Kreisman arrived just after the last Review issue went to press. We quote: "The kids at college are looking younger and younger. Does that mean anything? You should inform our Class that the M.I.T. Club of New York is located at 115 East 40th Street, just two short blocks from Grand Central Station. Anybody passing through New York can find old friends having lunch there from 12:00 to 2:00. I tried to gear myself to the printing industry as much as possible at M.I.T. all through XV-A and IX-B, and after graduation went to a printing trade school in Tennessee for four months. That was two years ago. Then got some shop and production experience and am now selling — making as much of a forte as possible in engineering and industrial management catalogues, manuals, reports, and so on. I'm with Isaac Goldmann Company, printers and lithographers, New York. There's nothing like an engineering background. Don't hesitate to send the word out that there is probably as much room for engineers and good industrial management in the graphic arts as anywhere; and an industrial revolution in this field is just around the corner."

Another letter comes from Bob Shooshan, whose wedding we reported some months back. It seems that while honeymooning in New Hampshire, he bumped into an old Tech classmate upon the summit of Mt. Chocorua, Alan Davison. What a small world, etc., etc. He and his bride are now living in a Cape Cod cottage in Manchester, Conn., the "City with Village Charm."

One final letter from a classmate, who started the new year right with a letter to let us know of his doings for the past few years, Jim Manson: "After graduation in Course VIII, I accepted a research fellowship at the Applied Science Laboratory of the University of Cincinnati. Before leaving the environs, however, I became engaged to Nancy Richards of Wellesley Hills. I'm sure many of our classmates have had their tongues depressed and noses tweaked by her father, Dr. Lyman Richards, who is on the staff at the infirmary. Nancy and I were married in April, 1949, returning to Wellesley Hills for the event. As proof of the beneficial effects of marriage, I proceeded to get an A in every course that spring. While at Cincinnati, I completed a master's thesis on polymer-metal adhesion, and enjoyed a wide range of courses, from organic chemistry through Professor Boris Podolsky's courses on theoretical and modern physics, and even including Professor Herget's course on minor planet orbit computation. Last spring, an M.S. and a 'broad background' behind me, I decided to return to the northeast, where we could enjoy those activities and friendships which we had started as students. I was fortunate to be offered a position with the cloud physics group of the Geophysics Division of the Air Force, Cambridge Research Center, which is very conveniently located. On the 13th of August we were blessed with a baby girl, Cynthia, who immediately took over the center of our stage. Up to that time we had been busy planning for our house, which is one of the Kalmia Woods group in Concord of

which many of the Technology family are members. For the future, I'm hoping to get up a quorum for 8.411 next fall. Anyone interested in statistical thermodynamics, please write the Physics Department, so they'll offer this course on the off year."

The mailbag's empty, so for another month we'll close with the usual plea for news, information, gossip, and so on. — WILLIAM R. ZIMMERMAN, *General Secretary*, 1604 Belmar Road, Cleveland Heights 18, Ohio; RICHARD H. HARRIS, *Assistant Secretary*, Lovell Road, Holden, Mass.

• 1949 •

A letter from Dave Moore states: "Have just finished a job as junior field engineer on a Wilmington power plant and am now in the home office (United Engineers and Constructors, Inc.) working as a draftsman, which is part of their training program. In the spring I was engaged to Marjorie Cunningham of Wheeling, W. Va. Visited with Jerry Lewi who is stationed at Fort Monmouth in the Signal Corps."

Ruth Norton, in her initial campaign, was elected to the Salem School Committee. Ruth is currently associated with the Massachusetts Department of Public Health as a bacteriologist.

Bill Lam, after graduation, founded the Lam Workshop in Brookline where he is making modern lighting history. Bill has developed a series of lights, each with a specific purpose in mind — reading, decoration, general illumination, and so on. They are essentially modern and are characterized by simplicity of structure. His latest is a lamp shade molded from an impregnated glass fiber mat which can be snapped onto overhead ceiling fixtures. Congratulations, Bill, for engineering the design of your lamps rather than imitating the customary dust-collecting designs.

Paul Weamer writes that he is "working for a food broker in Boston and living in Brookline. A fraternity brother, Al Collins, is an ensign in the Naval Air Corps, and another DTD, Jim Stevens, is living in Coopersburg, Pa." From Pointe-a-Pitre, Guadeloupe, Georges Diligent writes that he has taken over his father's contracting firm and on July 14 opened a new hotel, the Grand Hotel. Jim and Peggy Berman were among the first guests. On July 29, he was engaged to Marie-Therese Fayel, will be married this March, and plans a U.S. honeymoon ending up in Boston in time for the Assemblies Ball. Upon returning to Guadeloupe he has planned a five-year schedule that includes constructing a 1,200-seat movie theater, two tourist centers, one in the mountains and one near the beach, and a 45-unit apartment house. Georges went on to describe the French and Creole atmosphere of his beautiful Guadeloupe and to extend an invitation to all '49 men to be his special guests.

Two items I overlooked last time were the arrival of a baby girl to the Hank HENZES last September, and, while in Chicago, I enjoyed a beer with Brad Endicott, who is in the Sear's trainee program.

Engagements: John Rhodes to Jean Peterson of West Hartford, Conn. John is

with the Industrial Nucleonics Corporation of Columbus, Ohio. Weddings: Jack Baker to Mary Jesson on December 22 in Dedham, Mass. Jack is at Lowell Textile Institute. Richard Hands to Shirley Devine on October 27 in Royal Oak, Mich. Dick is with General Motors in Detroit. Howard Kothe to Mollie Hubon on December 13 in Brooklyn. Howard is in the patent department of Cities Service Research and Development Company and is also attending Brooklyn Law School. Paul Ostergaard to Jacqueline McKnight on November 24 in Rockville, Conn. Charles Smith to Mary Lincoln on December 15 in Bridgeport, Conn. — CHARLES WILLETT HOLZWARTH, *Secretary*, 33 East Empire Street, San Jose, Calif.

• 1950 •

Before I go too far this month, I want to make apologies to three wonderful people, Barbara Wilber, Richard Holmberg, and Richard Holmgren. Weaver's 100 per cent grapevine is now only 99.9 per cent correct. In the November, 1951, issue of *The Review*, I reported that Barbara Wilber was wed to Sigmund Holmgren. T'aint so says Sigmund in a communiqué to me on the back of a Christmas card. So I checked my sources and found that Barbara was wed to Richard Holmberg. I know that you love your husband, Barbara, and I didn't mean to marry you to someone else. I'll see that it doesn't happen again and, in the meantime, lots of luck to Mr. and Mrs. Richard Holmberg. As for Sigmund Holmgren, he is working in Alaska with the Public Health Service. He is working in Juneau and has a fine job, beautiful blonde secretary, and lots of interesting work. Wonderful scenery when you can see it. They are going through those long winter nights up there now, but from the gist of his card he's really enjoying Alaska. Received loads of cards and letters over the Christmas holiday and I'm sorry I haven't found time to personally answer each and every one, but all the news will be put in the notes to keep the Class informed.

Marilyn Janet Paul was wed on October 20 to Joseph Grano. Joe is now serving with the Army and he is stationed at the Army Chemical Center in Maryland. Also stationed at the Chemical Center in Edgewood, Md., is Lieutenant William B. Nichols. Just before Christmas Lieutenant Nichols and Constance A. Haberkorn went up the middle aisle at the Grosse Pointe Memorial Presbyterian Church, Grosse Pointe, Mich., and became Mr. and Mrs. Nichols. They will reside in Edgewood, Md. Antonia Bissell of Wilmington, Del., was wed to Walter J. Laird, Jr., who is also a Wilmington resident. After a wedding trip, the Lairds are settling down in Schenectady, N.Y. Alice Elizabeth Chefalo became the bride of Samuel Ernest Perkins last October and they are now living in Winchester, Mass.

Engagements: Marian Sedgwick to Charles Chittick. Charles is in the Naval Reserve and is now stationed at Pensacola, Fla. Ellen Ehrlich to Lieutenant Melvin J. Gardner. Mel is with the Signal Corps and still stationed at Ft. Monmouth, N.J. Marilyn B. Smith to James A. Hooper. Jim is still at the Harvard Business School

but the Navy is breathing down his neck. He expects to be called this summer. Suzanne Appleton to Louis Lehmann. Jane C. Mason to Roger Manasse. Anne Murphy to Per Cappelen Smith. Patricia Anne Honeker to Lieutenant Robert A. Snedeker. In November I reported that Bob was working for Monsanto, but Uncle Sam called before Bob had a chance to get started. He is stationed in Miami with the Air Force and is planning a June wedding.

Al Pendleton writes that life in Cleveland is wonderful. After spending eight months in the field office of Bruch Development Company, he is now working at the factory in Cleveland. Martin S. Osman is now a design engineer at I.B.M. in Poughkeepsie. Bob Bissell is in his second year of a two-year training program at the New York Air Brake Company in Watertown, N.Y. Quoting from Bob: "Up here where the snow piles up to four feet in one night, I haven't heard too much from other '50 men, but I did get a letter from Don Bernitt a while ago. He's not working for Boeing anymore, but is working for an unnamed firm doing instrument design and research, in Seattle, Wash., that is. As for myself, my bachelor days are numbered. Sometime in the near future Patricia Speth of Manhasset, N.Y., will become Mrs. Bissell." A letter from Al Gallucci '51 states that he is an engineer with the Grasso Construction Company, located in Shelton, Conn., and that he will welcome any correspondence from his old buddies. Chuck Nolan is working for his dad in the Nolan Brothers Construction Company. He has just finished up a big dam job in San Angelo, Texas, and he is now up in Minneapolis doing some work. (Above information furnished by my Oklahoma representative, Richard Rorschach.) Rich goes on to say: "Jack Corrie was through Oklahoma City in November and over a couple of brews I found out that Jack had left school at Harvard in favor of sunny California. Bill Helmich is in the Seabees. He's an officer, I think. He went in as chief and since then I believe that he has gone through officer's school. Curt Snow '51 is over in North Africa working for a contractor building airfields. Tripoli isn't too bad, says Curt; plenty of bars, good wine, lousy beer, and a little whiskey. Joe Fleming is working for M.I.T. T. K. Stromsted got married a year ago and is living and working in Chicago for Factory Mutual Engineering Division." As for Rich, himself, he is sweating out his master's at Oklahoma University while Uncle Sam is also breathing down his neck. He expects to be joining the rest of us in February or March.

Lieutenant Jim Baker has been transferred to Brooklyn to do some I.B.M. work for the Armed Service Medical Procurement Agency. Lieutenant Ed Berninger is with a self-propelled weapons unit in New Mexico. Richard A. Butterworth, the Course XIII boy, is in the Army as of last August. Lieutenant Allen Bryson is at Falls Church, Va.; Lieutenant Henry M. Butler is at Aberdeen; Lieutenant Cosimo Cataldi is over in Europe with a Signal Service Battalion; Lieutenant Robert Cesari is with the Ordnance Department at Frankford Arsenal, Philadel-

phia; Lieutenant Oscar Eubank was called in last October; Private Frank Ferrigno is at Huntsville, Ala., working at the Redstone Arsenal; and Lieutenant Evert N. Fowle is living in Norfolk, Va. Gregory G. Gebert is at Lackland Air Force Base in Texas; Ralph Kristoferson was promoted to captain last fall and is now living in Alexandria, Va.; Lieutenant Warren Marcus, Lieutenant William Lynch, and Lieutenant William Morris all were called into active service but I have not been able to find where they are stationed. Private Ulysses A. Pournaras shipped over to Europe with the Corps of Engineers; Lieutenant Richard Schweizer is at Aberdeen, Md., with the Ordnance; Lieutenant Robert Stout is out at Albuquerque, N.M.; and Private Jim Watt shipped over with a topographic battalion to Europe. As for Lieutenant Weaver, I arrived at Belvoir, Va., and promptly started seeing familiar faces. So far I have been able to locate the following Corps of Engineer men: Lieutenant Len Caro, Lieutenant Jim Cass, Lieutenant Karl Ahlstrand, Lieutenant Bill Flye, Lieutenant Lawson Harris, Lieutenant Tom Keane, Lieutenant Al Petrofsky, and Lieutenant Frank Winiarski. The Belvoir Technology Club sends its glad tidings to all the '50 men. Nano Romaguera was finally inducted into the Army. He reported on December 24, 1951, and they gave him a nice new uniform. Lieutenant David Gushee is a chemical mortar platoon leader in Korea. Pfc. Lybrand P. Smith is at present serving in Korea as troop information and education man for an engineer outfit, advising personnel on U.S. Armed Forces Institute courses, maintaining a library, and running a unit newspaper. Private Ronald J. Rabalais is now taking basic training out in windy Fort Riley, Kansas. Lieutenant Ed Fox was called into Uncle Sam's service and is living in Dayton, Ohio. Oh yes, can't forget Bill Price. Was sipping a beer the other evening when I walked Bill. He's looking swell. He shed about 50 pounds after he donned the Army uniform last summer and right now he's in "fighting shape." As for your reporter, J.T., I expect to be here at Belvoir till at least July and maybe next September or October. Keep the news coming. One last piece of news that was just told to me by Tom Keane. Jean Lamont of Trenton, N.J., was engaged to William Proctor of Yardley, Pa. Bill is working for the Atlantic Refinery in the Philadelphia area. — JOHN T. WEAVER, Secretary, 1772 East Tremont Avenue, Bronx 60, N.Y.

• 1951 •

In January, a miniature '51 reunion was held at the Harvard Business School. Art Wasserman, who returned to M.I.T. from Oak Ridge to finish work on his master's degree, stopped over to have dinner with Fred Weitz, our Class Agent, and your Secretary. During the meal, Marv Grossman joined the group to participate in the discussion concerning the activities of the '51ers. Glen Battaglia and John Lindholm stopped by to say hello. Art Wasserman expects to go to England next fall to begin a three-year program as a Rhodes Scholar at Oxford University. Other news

from the discussion disclosed that Herb Voelcker is now in the paratroopers at Ft. Benning, Ga., and Johnny Leffler is now a proud papa. He is doing construction work in Pennsylvania.

Among those who have become engaged are the following: Dick Fidler to Katharine Edgar (Dick has been recalled to active duty by the U.S. Navy); George Underwood to Suzanne Emory; Dick Brown to Sandra Lewis with plans for a March wedding; Skip Mott to Joyce Dickenson (Skip is now connected with Army Ordnance); and Burt Dempster to Ellen Hilles, with plans for a summer wedding. Of those who tied the marital knot, we find the following: Phil Gruber to Eleanor Burns at Lowell in November; Alan Fallor to Ruth Jean Grant at Boston in November; Bernard Spring to Phyllis Tubiolo at Medford; and Al Ginkel to Jean Henderson in November at Rochester, N.Y.

Ensign Charlie Gern reported for duty in the Production Department of the U.S. Naval Shipyard, Charleston, S.C. Dick Chiacchia was attending basic school at the Marine Base at Quantico, Va. Harold F. Reed was assigned to the service battery, 34th Field Artillery Battalion, at Fort Dix, N.J. Also, Eric Robba graduated from the Naval Officer's School at Newport, R.I. With regard to civil defense, Dean Boorman is a technical aide to a "structural projection" committee which is carrying out a survey of building in several Massachusetts cities to find out what buildings are suitable for air raid shelters.

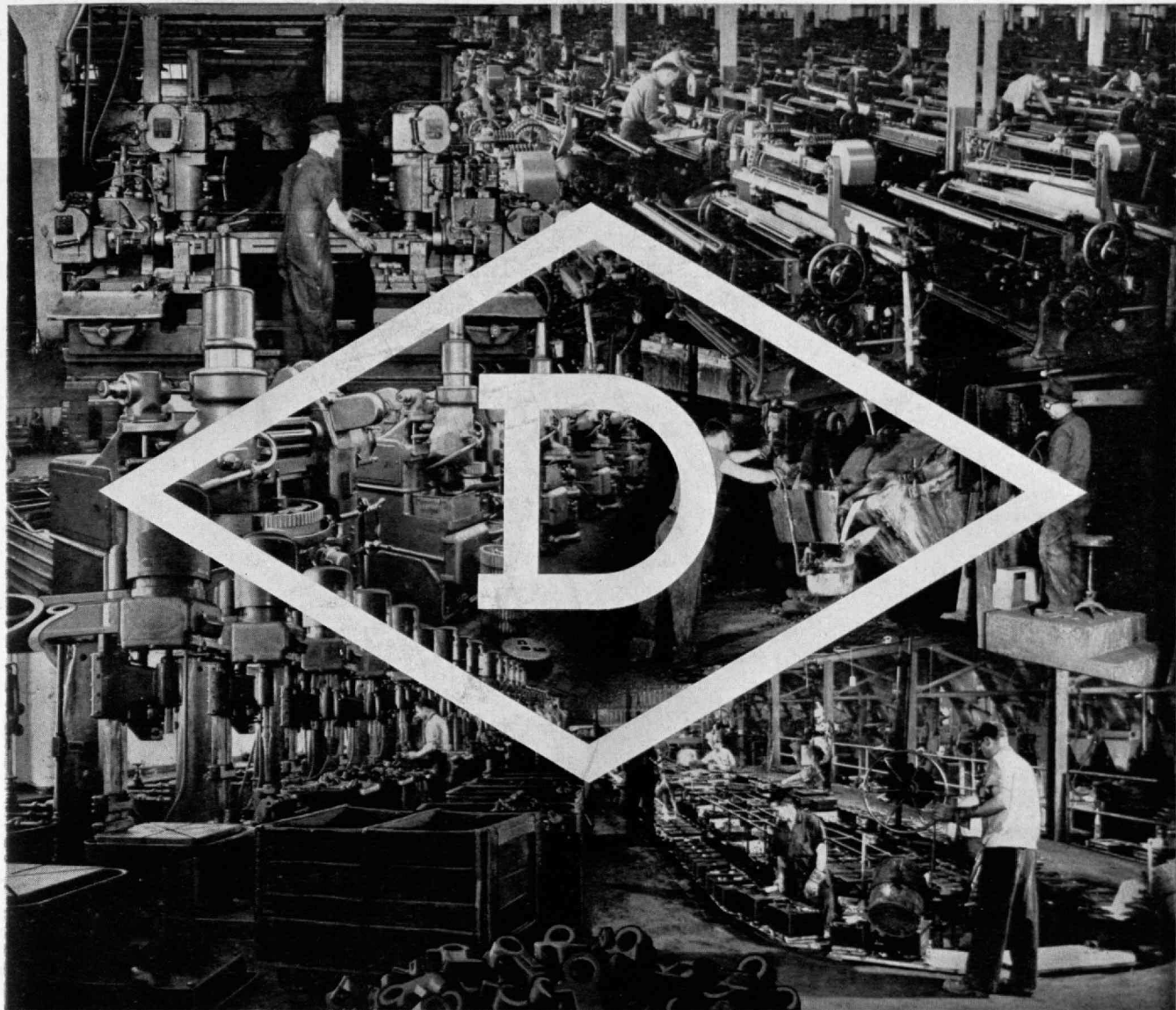
In a letter from Kinston, N.C., Sandy Sussman writes: "Am here as a student officer in pilot training and have been at it for six weeks. The ground school classes aren't bad, and all that flying takes is practice and confidence. I spend about five and one-half months more here and then (if I get through) hope to go to jet school at the Williams Air Force Base in Arizona. Glenn Mackey is to arrive here soon." Sandy also reports that Dick Moroney is training to be a jet flyer. Larry Schneck is working for Sperry Gyroscope at Great Neck, Long Island, and Jim Michelman is now "one of the boys in the service"; he is at Fort Dix. Bill Shenkle, who is one of the many '51 men stationed at Wright-Patterson Field at Dayton, responded with a letter concerning his activities. He states that he has been rooming with Tom Biggs, Ken Harms, and Fred Aldrich. All three of them are working for the Research and Development Command at Wright Field in various laboratories. Bill adds: "I'm working for the Photographic Reconnaissance Laboratory and am quite lucky to be working with another M.I.T. '51er, Gene Koch. We are in the project control unit of this particular lab, in an administrative capacity. On the side, we are attending Ohio State University Graduate Center on the base. I often see Bob Gooch, Hal MacKay, Ralph Romano, Bill Freeman, George Butzow, and others of the procurement section." As to marital plans, Bill states that he is engaged to Betts Stewart. Ken Harms is engaged to Elaine Andrews, while Fred Aldrich and Janice McMahon announced their intentions. Ken and Bill will walk the marital path with their brides in June, while Fred Aldrich expects to be married in September.

Congratulations to you all! A card from Harry Lowell informs us that he will join the ranks of the married men in July. Harry is working for Bethlehem Steel at Bethlehem, Pa.

A delightful surprise occurred when Jerry Austen reported that he, Walt Stahl, and Wendell Batchelder are at the Harvard Medical School. Jerry adds: "It's quite a change after four years of mechanical Engineering at M.I.T., but I like it very much." This news tends to illustrate the versatility of the Tech men! Russ Osborn reports that work as a safety engineer for Liberty Mutual Insurance Company is very satisfying. He adds: "I'm still waiting for a call to active duty with the Naval Reserve." By the way, Russ and his wife, Rita, have a six-months-old son, Kevin. An excerpt from a letter from Ray Gruwell follows: "I am employed with the M. W. Kellogg Company in New York City as a design engineer. Also with me in the heart of Manhattan is Sam Greco, another Course X grad. Other '51ers in my vicinity are Gil Stevens at Foster-Wheeler, Elliott Griffith with Arabian-American Oil Company, and Gene Graham at California-Texas Oil Company. All of us are connected with the oil industry in one way or another." Lou Schaeffer informs us that he is now with Gulf Oil at Pittsburgh after spending several months doing field work in Wyoming.

Joe Amblard is employed as a sales engineer in Montreal. George Todd is now at the U.S. Naval Ordnance Test Station at Inyokern, Calif. The Allis Chalmers Manufacturing Company has the services of Bill Wallace. Bob Walter is doing work for the Ethicon Suture Lab, Inc., at New Brunswick, N.J. Malcolm Ward is connected with the Marine Division of the Gulf Oil Company, while John Washburn has joined the Singer Manufacturing Company at Bridgeport, Conn. The Westinghouse Division at Elmira, N.Y., has the services of John Whiteley. Munroe Veazie is working for the Owen Corning Fiberglass Corporation at Newark, Ohio. Myron Lecar decided to work for his master's degree at the Case Institute of Technology; in addition, he has a teaching assistantship. Jerry Levine is employed by the Hazeltine Electronics Corporation at Long Island, while Gil Lewis is taking the Loop training course at the Bethlehem Steel Company. Charles L. Miller has been promoted to the position of assistant to the district engineer at Michael Baker, Jr., Inc., a consulting engineering firm. Dave Bossen is on the staff of the Industrial Engineering Department of Alcoa at Clinton, Iowa. John Conley is with the Consolidated Training Company in New York City. And Dean Cogswell is doing personnel work at the New England Mutual Life Insurance Company in Boston.

Harold Cleary is connected with the comptrollers division of the Radar Warning Command at Roslyn, N.Y. Bob Butters is now in the Air Force while Fred Bumpus is with the Army at Fort Lee. Jerry Lyons, when last heard from, was an ensign aboard a Navy destroyer operating from Pearl Harbor. — STANLEY J. MARCEWICZ, Secretary, Morris D-34, Harvard Business School, Soldiers Field, Boston 63, Mass.



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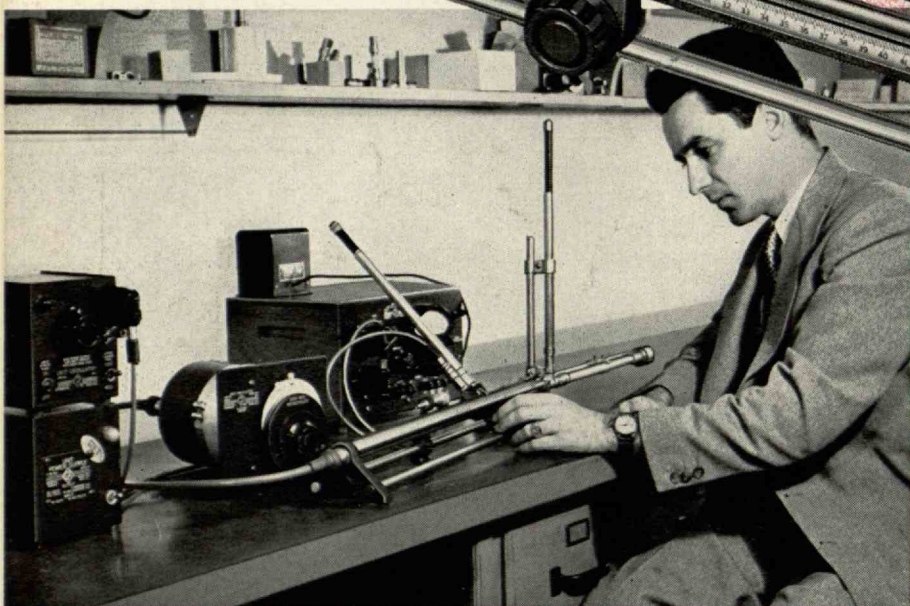
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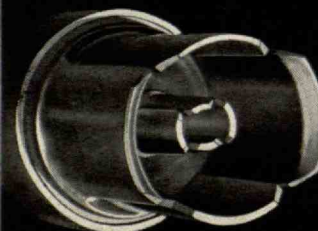
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